THE IRON TRADE REVIEW

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United States Will Benefit

From European War, is Prevailing Opinion, But Some Industries Will Lose for a Time

Developments in Europe have come so rapidly and are of such tremendous importance to the whole world that it is difficult to estimate the effect, present and future, on the manufacture of iron and steel in the United States, but there is very strong feeling that ultimately the results will be beneficial to this country. The cutting off of imports from England, Germany and Belgium removes for an indefinite time all danger of competition under the present low tariff law. As to exports, some manufacturers of machinery and iron and steel products will feel keenly the loss of European business. On the other hand, unusual opportunities for extension of business to foreign countries not involved in the war are presented. South America offers an extremely attractive field. Unfortunately the humiliating condition of not having American ships in anything like adequate number to carry American products abroad now confronts the nation. President Farrell and other leading iron and steel manufacturers will take a prominent part in the efforts which are to be made to establish as quickly as possibly an American merchant marine.

The action of the Steel Corporation in withdrawing all quotations and quoting $1 per ton higher on finished steel products, on application, is likely to be followed by independents and a general advance of prices is probable.

Pig Iron

Pig iron markets are extremely dull and both buyers and sellers have been made more conservative on account of the uncertainty of the effect of the European war. Some foundries making castings for the European markets will suffer for a time. The production of pig iron for the past month was 1,958,267 tons, an increase of 53,701 tons, due to July having one more day than June. The average daily production in July was 63,170 tons, a loss of 316 tons compared with June. The decrease in production was due to the blowing out of merchant furnaces. There were 187 stacks in blast July 31, the smallest number since Aug. 1, 1908.

Railroad Buying

If ships can be obtained in which to transport the tonnage, it is probable that considerable export rail business will be awarded to American mills, including 28,000 tons for the Victorian government and about 10,000 tons for Chile. Deliveries on a recent order of 12,000 tons of rails taken by the Pennsylvania Steel Co. for Queensland have not been made owing to inability to obtain vessels. News from the old world has completely overshadowed the announcement of the decision in the railroad rate case. No effect of this decision is yet discernible and railroad buying is very light.

Ferro and Tin

All quotations on ferro-manganese have been withdrawn and it is almost impossible to buy this product. Fortunately, many consumers bought liberally last January and are well supplied. Prices of pig tin have advanced from 31 cents to 58 cents a pound at New York within a few days. Leading manufacturers of tin plate are well supplied with tin, but it is probable that some of the smaller mills will be compelled to close, if the European war should be long continued.

THE OPEN HEARTH

Importance of Strict Neutrality

HAPPILY, on account of its wise policy toward foreign nations which has prevailed since the foundation of the government, and also on account of geographical location, there is little danger of the United States becoming involved in the great European war. It is well, however, for Americans to remember that there is a possibility of serious complications with some of the warring nations arising. Already in this country very strong feelings for and against the warring nations are being expressed by American citizens and foreigners within our gates. There have been noisy demonstrations, necessitating police interference, in some American cities, and more may occur. It behooves every American and every foreigner sojourning in this country to help in maintaining strict neutrality. The Austro-Hungarian vice consul at Cleveland, John Pelenyi, has given some exceedingly wise advice to his countrymen. "We are," he says, "living in a friendly country and any outward evidence of our feelings would be an abuse of the hospitality we are enjoying here."

The efforts of thousands of foreigners to enlist and go to their fatherlands to participate in the war may cause embarrassment to the national government. Some authorities on international law assert that the United States government is likely to prevent European reservists and volunteers of all nationalities from going to Europe to fight. These authorities hold that it will be a violation of neutrality if the United States government allows shiploads of former European soldiers to leave this country to join the armies of Europe to fight against nations with which we are at peace. It is also asserted that foreign nations have a right to detain any vessels on the high seas and demand that soldiers known to be traveling to hostile territory be handed over to them as captives of war, just as they would take possession of contraband of war. Possibly this opinion would be combatted by other authorities, but the best way to prevent any semblance of violation of neutrality is for foreigners and Americans as well not to make any demonstrations for or against any foreign nation. Manufacturers will be able to wield a good influence in advising employes not to attempt to join any of the foreign armies.

Pursuing Blackmailers

THE news that two indictments have been found on charges of blackmail against business agents of labor unions in Chicago is encouraging, for it furnishes reason for believing that not only in Chicago, but in other cities, blackmailing and other illegal and corrupt methods of labor agitators will be checked. To some extent, we are glad to say, unions are co-operating in the cleansing, and employers also have a duty to perform. The *Chicago Herald,* which has rendered splendid service in exposing the attempts of blackmail, inquires why these two indictments have been returned before others. The answer, which the *Herald* says ought to be taken to heart by every man in Chicago who has found himself a victim of the outrageous system of business agent blackmail, is that William H. Marshall, from whom the business agents attempted to extort $250 in connection with unloading boilers by an express company for a public school in South Chicago, did his part in assisting the public officials. When the demand to "kick in" was made upon Mr. Marshall, he went to the state's attorney's office, a trap was laid and one of the would-be blackmailers walked into it.

As the *Herald* points out, reputable newspapers can do much in exposing unlawful acts, "but, in the last analysis," adds the *Herald,* "the most effective force for reform in the world, the most efficient ally that the law can have, is the man who is himself prepared to fight rather than suffer a wrong, is willing to get out and fight when a legal remedy presents itself."

If business men throughout the country who have been blackmailed, or upon whom attempts have been made to extort blackmail, had the fighting spirit of William H. Marshall, of Chicago, prisons would soon contain many new faces and lawless methods would receive a severe setback.

THE OPEN HEARTH

The Iron Trade and the Rate Decision

THE announcement of the long-delayed decision in regard to the advance in railroad freight rates will not be of great importance in immediate results, but it is highly important as showing the difficulties of arriving at a just determination of what rates ought to be and also as a recognition of the changed conditions which have warranted railroads in at least a part of the country in asking for higher rates.

Throughout the consideration of what has been known as the 5 per cent advance case, the general sentiment of the iron and steel manufacturers of the country has been one of willingness to bear their full share of the burden of higher rates, because they were convinced that some advances were equitable and would contribute to the return of prosperity by enabling the railroads to order necessary equipment. Hence we believe that there will be general acquiescence in the iron trade, with few, if any, complaints regarding the advances which will affect manufacturers of iron and steel products. The justice of excluding from the advances such low grade commodities as coal, coke and ore is apparent. In some cases relating to these products, adjustments have recently been made, while in others hearings have been had or are in progress.

One of the very interesting features of the decision is found in the recommendations relating to methods by which it is claimed the railroads can eliminate a great deal of free service and save large amounts of money. Naturally any men who have been engaged in a business for years are likely to resent suggestions from those who have no practical experience in that business, and the fact that Mr. Brandeis has had such an important part in bringing about recommendations relating to economies has caused many in addition to practical railroad men to doubt whether the suggestions as to economies would result in the predicted saving of money. Nevertheless, helpful suggestions often do come from those not directly connected with a business and from those who have newly entered a certain sphere of activity. Commissioner Daniels, in his dissenting opinion, holds that it was not a necessary or proper function of the Commission to make proposals to the carriers as to how they might conserve their revenues without advancing their rates. This is a matter on which opinions will differ. We believe that if in an investigation as to whether rates should be advanced it is discovered that the railroads are wasting money for any reason, it is the duty of the Commission to make the fact known and to offer any suggestions which it may deem wise as to effecting economies and abolishing abuses.

Work and Play at Nela Park

THE new home of the National Lamp Works of the General Electric Co., which was visited last Saturday by nearly 200 members of the Cleveland Engineering Society, is a most impressive illustration of modern progress in engineering and salesmanship. The place is very properly called Nela Park, for it seems more like a great park or a college campus than the works of a manufacturing concern. It is, of course, not a place for manufacturing, but it is more than a laboratory. It is more than a research bureau. Located on a hill, far removed from the smoke and noise of the city of Cleveland, it is a meeting place for the scientists and the 200 salesmen of the company. They come and camp in relays week after week throughout the summer in the comfortable tents provided, not merely for scientific purposes, but also to get better acquainted, to help solve each other's problems, to commune with nature and indulge in healthful recreation.

The old saying that "All work and no play makes Jack a dull boy" was never more honored than at Nela Park. There the salesmen can wander about the delightful grounds, hold meetings under the trees, saunter through the glens, play tennis and other games and go away invigorated and enthused.

Nela Park is showing to the world how the largest results in business are inseparable from the best methods of recreation, the keenest enjoyment of the beautiful and the most vigorous health.

Prices Present and Past

Quotations on leading products today, average for last month, average for three months ago and average for August, 1913. Prices are those ruling in the largest percentage of sales at the dates named.

	Today's prices.	Average for July, 1914.	Average for May, 1914.	Average for Aug., 1913.
Bessemer pig iron, Pittsburgh..	$14.90	$14.90	$14.90	$16.52
Basic pig iron, Pittsburgh.....	13.90	13.90	13.90	15.07
No. 2 Fdy. pig iron, Pittsburgh.	13.90	13.90	14.09	14.71
Northern No. 2 Fdy., Chgo....	14.00	14.00	14.25	15.00
Lake Superior Charcoal, Chgo..	16.00	15.75	15.75	15.00
Malleable Bessemer, Chicago...	14.00	14.00	14.25	15.00
Southern No. 2, Birmingham...	10.00	10.13	10.43	10.88
Southern Ohio No. 2, Ironton..	13.50	13.50	13.50	14.00
Basic, eastern Pa.....	14.00	14.00	14.00	15.00
No. 2X Virginia furnace.....	12.50	12.50	12.75	13.00
No. 2X Foundry, Philadelphia.	14.60	14.60	14.75	15.75
Ferro mang., Balti., nominal....	38.00	37.50	38.50	56.00
Bessemer billets, Pbgh. & Ygn..	19.00	19.30	20.00	26.12
Op. h'th sh. bars, Pbgh. & Ygn.	20.00	20.20	21.00	27.12
Bess. sheet bars, Pbgh. & Ygn.	20.00	20.20	21.00	27.12
Op. h'th billets, Pbgh. & Ygn..	19.00	19.30	20.00	26.12
Steel bars, Pittsburgh.....	1.15	1.11	1.15	1.40
Iron bars, Philadelphia.....	1.17	1.17	1.20	1.37
Steel bars, Chicago.....	1.28	1.25	1.29	1.58
Tank plates, Chicago.....	1.28	1.28	1.29	1.63

	Today's prices.	Average for July, 1914.	Average for May, 1914.	Average for Aug., 1913.
Structural shapes, Chicago.....	$1.28	$1.28	$1.29	$1.63
Iron bars, Cleveland, local del'y.	1.20	1.20	1.20	1.50
Iron bars, Chgo. mill.....	1.05	1.10	1.10	1.45
Beams, Pittsburgh	1.15	1.11	1.15	1.45
Beams, Philadelphia	1.25	1.25	1.25	1.55
Tank plates, Pittsburgh.....	1.10	1.11	1.12½	1.44
Tank plates, Philadelphia.....	1.25	1.25	1.25	1.55
Sheets, blk., No. 28, Pittsburgh.	1.80	1.80	1.87	2.20
Sheets, blue an., No. 10, Pbgh..	1.35	1.35	1.37	1.65
Sheets, galv., No. 28, Pbgh.....	2.75	2.75	2.80	3.25
Wire nails, Pittsburgh.....	1.55	1.51	1.57	1.66
Connellsville fur. coke, contr....	1.85	1.85	2.00	2.50
Connellsville fdy. coke contr....	2.40	2.40	2.50	3.00
Heavy melting steel, Pbgh.....	11.50	11.55	12.00	12.50
Heavy melting steel, east'n Pa..	10.50	10.50	10.75	11.50
Heavy melting steel, Chgo.....	9.50	9.75	9.94	10.50
Heavy cast, eastern Pa.....	12.25	12.00	12.50	13.25
No. 1 wrought, eastern Pa.....	12.00	12.25	12.50	14.25
No. 1 wrought, Chgo.....	9.00	9.00	8.63	10.50
Rerolling rails, Chgo.....	11.25	11.25	11.25	12.50
Car wheels, Chgo.....	10.75	11.00	11.38	12.50

(For Additional Prices See Page 270.)

Removal of Danger of Pig Imports

And Other Conditions Resulting from the European War Being Closely Studied—Sales of the Week Light

Philadelphia, Aug. 3.—European war conditions involving the removal of all danger of imports of iron, the interference with the shipments to this country of foreign iron ore and the withdrawal of several million of men from the industrial world, are being studied carefully by eastern and central Pennsylvania pig iron producers to determine the effects they will produce on the domestic market. Some leading sales representatives of the furnaces in this district, as a result, while not completely withdrawing their irons from the market, are taking a position of not quoting until conditions more clearly define themselves. In fact, the general attitude of both makers and consumers in this territory is one of waiting at present, but whether this is simply a further expression of the recent lassitude of the market or is an effect of the unprecedented foreign developments of the past week, cannot be stated positively. The market is extremely quiet. The total sales tonnage of the week is light. Cast iron pipe makers continue the principal buyers. Transactions of this character in the week reached 6,000 to 7,000 tons, including one lot of 1,500 to 2,000 tons of medium northern grades at $14, delivered, about 3,000 tons of southern for shipment out of this district and 3,000 tons of southern mottled to pipe shops in this district and in Virginia, the latter iron at a price of $9, Birmingham. Car wheel makers closed for several thousand tons of northern charcoal, including one lot of 1,500 tons, and sales of special Virginia grades totaled about 1,500 tons. Current inquiry is small. Prices show practically no change, northern No. 2X ranging from $14.50 to $14.75, Philadelphia, and Virginia No. 2X at about $12.50, furnace, though for immediate delivery $12.25 has been done. There is no demand for basic and transactions in low phosphorus have been few this week. The blowing out of the Hokendauqua furnace, as reported last week, leaves the Thomas Iron Co. without a single stack in operation, though it may blow in one of its smaller furnaces in the near future. The Lehigh valley furnaces now active include one Crane, Carbon and four Bethlehem.

Buffalo Awaits Developments

Buffalo, Aug. 4.—Furnace interests of Buffalo are looking for indications of the impression to be made upon the iron trade by the rapidly developing European war situation. There is a disposition on the part of producers not to book business beyond immediate needs, except at somewhat higher prices. Operations are being largely confined, for the time being, to the shipment of iron under contract.

A price of $13.25 is being asked as the minimum on No. 2X foundry by some interests and one furnace is asking $13.50; also quoting $13.75 on No. 1 foundry and $14 on 4 per cent silicon iron. Both buyers and sellers have, for the present, assumed an attitude of waiting. It is confidently believed in some quarters, however, that the outcome of the strife abroad will develop a large volume of business for American interests to handle in the absence of foreign competition. How far this will be offset by the uncertainties arising as the war progresses, remains to be seen.

Uncertainty Increases Quietness

New York, Aug. 4.—General uncertainty produced by war conditions has accentuated a quiet market in pig iron in the metropolitan and neighboring eastern districts and business is practically lifeless. The record of sales of the past week has been an extremely light one. Inquiries now pending aggregate only a few hundred tons. There is a common disposition among both buyers and sell-

(*For complete prices see page 270.*)

ers to allow the situation to clarify itself before committing themselves very far. A railway equipment maker who was asking for 900 tons of high silicon iron for western shipment closed for about 600 tons. An inquiry for 500 tons of foundry grades for an Elizabethport, N. J., buyer has been revived. Beyond this, there is nothing in the market but small lots. Another cargo of Wabana, Nova Scotia, iron, about 1,200 tons, is coming in at Bridgeport, Conn., on an old order, which will make the total shipments of this iron to this country under the recent selling campaign about 9,000 tons. There remains only a small tonnage yet to come in. As has been stated repeatedly, this iron is not being offered in this country at the present time. Prices at tidewater and vicinity show little change. No. 2X at Jersey tidewater remains about $14.25 to $14.50. Buffalo iron is firm at $13, furnace. The Port Henry, N. Y., furnace, where experiments with titaniferous iron ore have been conducted for some months past, was blown out Aug. 3.

Shipments Delayed

Cleveland, Aug. 4.—Some foundries whose product goes largely to manufacturers catering to the foreign trade expect that they will be compelled to ask for delay in shipments of pig iron, and, in fact, in a few cases such requests have already been made. There is very little buying of any kind of pig iron at the present time, owing to the uncertainty as to business prospects.

Valley Makers Face Higher Rates

Pittsburgh, Aug. 4.—Consumers of valley pig iron may have to pay higher delivered prices as a result of the freight rate increases allowed railroads in Central Freight Association territory. The advance probably will mean a rate of 95 cents from the Mahoning and Shenango valleys, instead of 90 cents, the present rate, although nothing definite has been announced by carriers with respect to any change in rates. Satisfaction is expressed by iron and steel makers at this point because iron ore, coke and coal were not included in the advances allowed by the Interstate Commerce Commission. The pig iron market continues decidedly quiet, although numerous small lots of foundry grades are being sold at a range from $13 to $13.50, valley, and reports of foundry selling at a shade less than the minimum figure are heard. The Standard Sanitary Mfg. Co. has sent out inquiries for August and September foundry requirements for plants at New Brighton and Allegheny, Pa. Steelmaking grades have not changed in position for four months, as monthly reports of W. P. Snyder & Co. indicate. These reports, based on sales of 1,000 tons or more, show that Bessemer and basic have been held at $14 and $13, valley, since April. Bessemer has not fallen below $14, valley, this year and it has not averaged more than $14.225; basic fell to $12.325 the initial month of the year and has not gone above $13.059, according to the Snyder figures.

Inquiry and Sales Drop

Chicago, Aug. 4.—Sellers of pig iron in this territory find inquiry has fallen off markedly in the past week and sales are correspondingly scarce. Some inquiry lingers in the market and sales of small tonnages are being made at the current quotations, but business as a whole has received a decided check. A manufacturer of castings for railway and theater seats is inquiring for 500 tons of southern iron for its Michigan plant and probably will close shortly.

Cessation of inquiry is attributed in some measure to passing of the buying wave that has been on for several weeks, but more particularly to the element of uncertainty of financial matters while banks and the government are outlining policies. Tightness of money and possible inability to obtain accomodation from bankers are holding the hands of buyers to a great degree and it is thought buying may be resumed as soon as the full effect of the European war is realized and discounted.

Northern No. 2 foundry and malleable are being held firmly at $14, Chicago furnace, and southern No. 2 foundry at $10.25, Birmingham, with small sales of either.

The Thomas Furnace Co., Milwaukee, has ceased operations at its stack in Milwaukee after being in blast only a few months on an unsatisfactory market.

Shipments in this territory in July about balanced the make, which was an improvement over the preceding two months, when some iron was piled.

Very Quiet at Cincinnati

Cincinnati, Aug. 4.—The Shirley Radiator Co., Indianapolis, is inquiring for 1,100 tons of foundry iron, divided between northern and southern grades. This is the only inquiry of importance in the market, as demand is limited chiefly to small lots for nearby shipment. Business done during the past week has been very low. A general war in Europe is not expected to have much of a direct effect upon the pig iron market, and will only affect it indirectly through the hindrance of exporting finished products.

Southern iron is quoted at from $10 to $10.25, Birmingham basis, for No. 2 foundry iron for either prompt or last half shipment, although the lower figure is being held mostly for prompt delivery only. Southern Ohio No. 2 foundry iron is quoted at $13.50, Ironton basis.

Consumers Do Not Buy

St. Louis, Aug. 3.—The European war cloud seems to have scared off all the pig iron purchasers in the St. Louis market, and nothing but carload inquiries are out. Ferro-manganese is said to have been withdrawn from the market, and no quotations are out. Southern No. 2 is quoted at $10.25, Birmingham, for August and September delivery. Northern prices are unchanged from last week.

Ten-Dollar Iron

Birmingham, Ala., Aug. 3.—Several Birmingham iron makers this week admitted their belief that the market in reality was $10, but they still insist they are holding out for $10.25 and $10.50.

One company sold approximately 10,000 tons during the week, but as far as can be learned, the remainder totaled very small sales. The company making the sales totaling 10,000 achieved this result through the closing of several orders which have been pending for some considerable time. The prices were not revealed, but it is believed it was $10 for No. 2 southern. It was scattered into a number of small orders.

Inquiry is very light. Outside of the one company, very little iron was sold last week in the Birmingham district and at present prospects for the next week are poor.

One buyer, when asked to pay $10.25 this week, stated he did "not want to pay a premium", and it is understood soon after he placed his order with another company, presumably at $10. One company reports the sale of about 100 tons at $10.25 and another 100 tons at $10.50 for late fourth quarter delivery. No sales are being made, as far as can be learned, for the new year.

Bolts, Nuts and Rivets

Pittsburgh, Aug. 4.—Makers of nuts, bolts and rivets at this center report a moderate improvement in business the last couple of weeks. Specifications have been coming out in better volume, especially for rivets, but prices do not show any improvement.

Contrary to previous practice, the Pittsburgh Coal Co., Pittsburgh, will not issue a semi-annual report.

(*For complete prices see page 270.*)

Cast Iron Pipe Makers

See Possibility of Increasing Business in South American Cities

New York, Aug. 4.—Cast iron pipe makers see in the present war situation a chance to increase their business with such markets as South America. The pipe market about the metropolis is quiet. Sharp competition continues to bring out close prices. The Donaldson Iron Co. took 1,455 tons of 6s to 12s for Duxbury, Mass., at $21.90, delivered, for the 6s, and $21 for the 8s, 10s and 12s. The same maker is low on 460 tons for Dalton, Mass. The United States Cast Iron Pipe & Foundry Co. has 675 tons of 24s for North Adams, Mass. Webster, Mass., will take bids Aug. 10 on 600 tons of 20s. Two contractors' lettings in this city, to open tomorrow, will require about 850 tons of 6s to 20s and specials.

Not Active at Chicago

Chicago, Aug. 4.—While some sizeable contracts are in view in the cast iron pipe market, they are few and not much small business is in sight among municipalities. Toledo, O., will open bids Aug. 10 for 6,000 tons of water pipe. The United States Cast Iron Pipe & Foundry Co. has been awarded 2,500 to 5,000 tons by the city of Chicago and also has taken 1,800 tons at Columbus, O.

Routine business is improving and a considerably larger tonnage is being booked than at any time earlier this year.

Billet Buyers

In the East Show More Interest in Forward Delivery

Philadelphia, Aug. 3.—Forward engagements of billets seem more attractive to eastern buyers and they are showing a little more interest in that direction. Leading eastern makers are more inclined to ask advances on forward contracts and the consumers have acquiesced in a few cases. Some eastern producers hold their minimum at $21.90, Philadelphia, or $19.50, Pittsburgh, on rolling, and at $24.90 to $25.90, Philadelphia, for forging steel for early delivery. A Lebanon, Pa., buyer is inquiring for 1,000 tons of small billets.

Quiet at Ashland

Ashland, Ky., Aug. 4.—The market at Ashland remains quiet and shows but little improvement. The Ashland Steel Co. is now operating in all departments, but the demand is not equal to its capacity. Billets are quoted at $20, and wire rods at $25, both Ashland basis.

Low Sheet Bar Prices Withdrawn

Pittsburgh, Aug. 4.—Low sheet bar prices offered early in July by Youngstown makers, have been entirely withdrawn, and no trace of anything below $20, mill, can be found, and serious doubt is expressed if material can be had at less than $21, Pittsburgh, by several in close touch with the market. Billets continue to be firmly held at $19, mill. Wire rods are unchanged at a spread from $24.50 to $25, Pittsburgh.

The Jones & Laughlin Steel Co., Pittsburgh, is now operating 32 tin plate mills at its Aliquippa, Pa., plant, having completed eight new mills recently. The plant consists of 32 mills. It is the largest single plant in the world. New equipment was installed in two months.

Lake Iron Ore Movement

Shows Decline Not As Large As Preceding Months—Holding Up Foreign Shipments

Ore shipments in July were 5,784,514 tons, as against 5,502,367 tons for June, an increase of 282,147 tons. It was expected that the increase would be something more than this, but some of the docks, notably Superior, show a falling off. The movement in percentage is, however, creeping up. The movement to May 1 showed a decrease of 68 per cent from that for the corresponding period last year. On June 1, the movement represented a decrease of 47 per cent, on July 1, 30 per cent, and on Aug. 1, 29 per cent. The total movement to Aug. 1 was 15,408,630 tons as against 24,329,460 tons to Aug. 1, last year, a decrease of 8,920,830 tons. These figures should afford a pretty good index as to what the season's movement will be. If the movement for the remaining months of the year would equal that of last year, the total movement for the season would be 40,000,000 tons. However, each month this year, with the exception of April, when only 269,686 tons were moved altogether, has been runing from 2,500,000 to 3,500,000 tons less than the movement for the corresponding month last year, so that it may be fair to assume proportionate decrease during the remaining months of the year, which would make the total season's movement work out in the neighborhood of 32,000,000 tons. It is likely, however, to be slightly better than that. Furnace men have consistently stayed out of the market and do not manifest any disposition even now to place ore orders. Shippers have given up expecting a buying movement during the present month and do not look for much activity even in September. Eastern furnaces which depend, to some extent, on foreign ores may buy Superior ores more freely.

Following were the shipments by ports during July and up to Aug. 1, with corresponding data for similar periods last year:

Port.	July, 1913.	July, 1914.
Escanaba	858,696	664,721
Marquette	496,725	297,413
Ashland	754,329	533,744
Superior	2,396,064	1,956,911
Duluth	1,938,716	1,169,410
Two Harbors	1,759,886	1,162,315
	8,204,416	5,784,514
1914 decrease		2,419,902

Port.	To Aug. 1, 1913.	To Aug. 1, 1914.
Escanaba	2,659,299	1,740,741
Marquette	1,556,501	681,361
Ashland	2,264,031	1,416,825
Superior	7,073,413	5,690,413
Duluth	5,934,664	2,949,286
Two Harbors	4,841,552	2,930,004
	24,329,460	15,408,630
1914 decrease		8,920,830

Foreign Shipments Halted

New York, Aug. 4.—Specific instances of the holding up of cargoes of trans-Atlantic iron ore for shipment to the United States, due to shipping interests taking precautions to protect their interests on the high seas, have appeared within the past few days. In one case, an Italian carrier about to take a cargo for Philadelphia from one of the French colonies in Africa was not permitted to land. A considerable part of the Swedish ore which now is coming into this country in larger quantities than any other European ore is carried in English bottoms. The effect of the war upon this traffic may accordingly be important. It is again well to emphasize, however, that eastern blast furnaces in this country have not been drawing upon European bases of ore supply in a large measure during the past year and that the complete cessation of this traffic would not be very serious.

(*For complete prices see page* 270.)

All Trading in Ferro Stopped

On Account of Main Sources of Supply of Ore and Product Being Shut Off—May Manufacture at Dunbar, Pa.

New York, Aug. 4.—Trading in ferro-manganese is at a standstill completely, as the result of the shutting off of the main sources of supply of both manganese ore and finished product by the European crisis. Since both English and German makers withdrew all prices several days ago, no material whatever has been offered and prices have become largely nominal. There is practically no unsold ferro in this country or afloat at the present time, although one lot of 500 tons is reported to be at Baltimore, awaiting sale. Various rumors are afloat of fancy prices having been offered or paid for spot material, but these cannot be confirmed. It is known, however, that offers of $40, seaboard, for delivery this year or next were declined shortly after foreign makers discontinued their schedules. Prices of ground ferro-manganese have been advanced 1 to 1½ cents per pound, making the new prices from 3¼ cents on lots of 2,000 pounds to 5 cents per pound on 100-pound parcels.

From the best information obtainable, it is indicated that the larger consumers such as the steel works have sufficient stocks on hand to meet their needs at the present rate of operations, for several months. In January, when this alloy was offered at bargain prices for this year's shipment, heavy purchases were made against an expected large consumption which has not been fulfilled. Barring a limited number of suspensions, shipments have been coming in liberally against these contracts, so that considerable stocks have been accumulated. The position of the smaller consumers, while probably not so good, is not believed to present the danger of any immediate shortage. It has been suggested that consumers will conserve their present stocks of 80 per cent material by the use of spiegeleisen and lower grades of ferro-manganese which can be manufactured in considerable quantities from ores in this country. Some large negotiations with domestic makers of spiegeleisen now under way. The European war situation shuts off the principal source of manganese ore supply for this country, which is Russia, and probably also that of India, leaving Brazil as the best base now unimpaired.

Immediately prior to the withdrawal of prices by foreign makers, considerable selling of this alloy for shipment through 1915 was being done as reported previously in THE IRON TRADE REVIEW. This movement largely was of English material and was done at $38 and $39, seaboard, both for shipment this year and last half. In all, probably 20,000 tons were booked. Eastern Pennsylvania steel works alone took 3,000 to 4,000 tons and a Pittsburgh independent is credited with a large purchase. A large tonnage of offers from consumers at the same prices or in some cases at $40, seaboard, was placed before English makers, but could not be put through.

Fluorspar Receives Attention

Steel makers are giving considerable attention to the fluorspar situation because of the probability of shipments being cut off from England. Domestic producers appear to be in good position to furnish a large supply, but the indications are that it will be at advanced prices. The schedule recently quoted has been $6.50 to $7 for lump and around $5 for washed gravel, prices being based at the mines. Shipments of 50 per cent ferro-silicon from abroad, have been interrupted. This alloy largely is manufactured in France, Austria, Norway, Switzerland and Sweden. Some quantities of the foreign material are under contract in this country. Domestic and Canadian makers probably will be able to supply the full demand.

May Make Ferro at Dunbar

In view of the possible shortage of ferro-manganese in this country as a result of the interruption of the supply from Europe, considerable interest is being shown at this time in the plans of the American Manganese Co., of Philadelphia, for manufacturing ferro-manganese from domestic ores at the Dunbar, Pa., blast furnaces, which has been referred to on various occasions. J. N. M. Shimer, of Shimer & Co., Inc., Bullitt building, Philadelphia, selling agents for the American Manganese Co., states that the company has been planning to put in one of the two Dunbar stacks upon ferro-manganese in about 60 days, but that if an emergency demand arises in this country, one of the stacks could be started within a comparatively few days, as it is banked at the present time. The company has been carrying on some repairs to its ore trestle and boilers, but these alterations could be discontinued and are not of a character that would interfere with the operations of the furnace. Mr. Shimer states that at the present time there is on the bank at Dunbar about 50,000 tons of manganiferous ore, analyzing from 18 to 22 per cent in manganese, sufficient to make about 25,000 tons of 30 to 40 per cent ferro-manganese. This ore is obtained from the properties of the Cuyuna-Mille-Lacs Iron Co. on the Cuyuna Range in Crow Wing county, Minn. The iron and manganese content of the ore runs about 60 per cent. It is stated that at greater depths than yet mined, manganiferous ore of 35 to 40 per cent content is available. Mr. Shimer makes the statement that with the ore in sight, the Dunbar plant would be able to produce annually 150,000 tons of ferro-manganese in the event that a demand for such a quantity should appear.

Mr. Samuel's Statement

In a circular letter to his customers, Frank Samuel, of Philadelphia, one of the leading importers of ferro-manganese, discusses the unusual situation that has arisen in this alloy because of European wars. Mr. Samuel says:

"At present it is absolutely impossible to forecast the future in regard to shipments of ferro-manganese. We will do our utmost to keep the users fully posted as to any change in the situation. As it exists today, we cannot see how ferro can be shipped until questions of universal importance have been settled. These questions are: First, whether English ships can carry it; second, the impossible war insurance risks existing today; third, the impossibility of making drafts or the payment of foreign exchange.

"The conditions that have arisen in the last week have been such that never existed in the history of the world before, and it is, therefore, impossible to forecast any future for material that is not only made from ores mined in Russia, India and Brazil, but which is made in England and necessarily shipped in English ships."

May Be Shortage

Cleveland, Aug. 4.—In the Cleveland district, some consumers of ferro-manganese expect that if the European war should be long continued, they will need considerably more ferro than they have purchased. They would

(*For complete prices see page* 270.)

gladly pay more than $40 per ton now, but there is none to be had at any price. An offer of $43 made for a small tonnage today was declined.

Ferro Situation Serious

Pittsburgh, Aug. 4.—The European war, the far-reaching influences of which have been felt in all parts of the world, threatens to cause a serious scarcity of ferro-manganese, and consumers who have not covered requirements confront a rather discouraging situation. Dealers have withdrawn all prices, and no material is being offered. The country is being scoured in an effort to locate available tonnages of this alloy. The Carnegie Steel Co., sole manufacturer of ferro-manganese in this country, has withdrawn as a seller of this alloy. Before dealers withdrew prices, sales were heavy, some German tonnages going as low as $37, seaboard.

Sheet Market Stronger

With Growing Sentiment in Favor of Higher Prices Sales Limited

Philadelphia, Aug. 3.—The eastern sheet market has a stronger undertone. In some cases, makers have asked and obtained $1 advance on forward deliveries or on the basis of 1.55c, Philadelphia, and 1.40c, Pittsburgh, for No. 10 gage blue annealed for eastern shipment. Consumers appear more disposed to expect and to pay advances on forward deliveries and they have been making some such offers to eastern mills. The current market is quotable from 1.50c to 1.55c, Philadelphia. New business and specifications are maintained at a fair tonnage.

Sheet Prices Advanced

Pittsburgh, Aug. 4.—Several makers of steel sheets have advanced quotations for black sheet products $1 a ton, and the market appears much firmer than a week ago. No. 28 gage black sheets are being held at 1.85c as a minimum, and some makers are refusing to shade 1.90c. Galvanized and blue annealed products occupy practically the same position as a week ago. Specifications have been coming out in fairly good volume, and new orders have been more satisfactory than those taken in early July. Plant operations have increased to some extent.

Otis Steel Co. Rolls

Cleveland, Aug. 4.—There is a strong sentiment among sheet manufacturers in favor of advancing prices and in some cases slightly higher quotations are being made. The Otis Steel Co. expects to be rolling sheets next month and has sold a round tonnage at fair prices.

Advanced at Cincinnati

Cincinnati, Aug. 4.—The feeling among local and nearby sheet makers is much more optimistic. Orders and specifications are much better in comparison with recent business, and prices have been advanced by all mills to from 2c to 2.05c for black sheets No. 28 gage, and from 2.95c to 3c for galvanized No. 28 gage, both Cincinnati basis. Two large makers in this territory are holding at nothing less than 3c, Cincinnati, for this latter grade. Blue annealed sheets No. 10 are quoted at from 1.50c to 1.55c, Cincinnati basis. Mills are also limiting the time of shipment to 60 days, and in no cases are they contracting beyond the third quarter. The Newport Rolling Mill Co. and the Andrews Steel Co., both of Newport, Ky., reopened in full on Aug. 3 with a force of 1,200 men. The American Rolling Mill Co., Middletown, O., is now operating all of its plants, as is also the case with the Portsmouth Steel Co., Portsmouth, O.

Sheets Are Advanced

Chicago, Aug. 4.—An advance of about $2 per ton has been made in steel sheets and apparently bids fair to be maintained. Makers generally have placed their prices at 1.53c to 1.58c, Chicago mill, for blue annealed, 2.03c to 2.08c, Chicago mill for No. 28 gage black, and 2.98c to 3.03c, Chicago mill, for No. 28 gage galvanized. While the advance has not been in effect sufficiently long enough for the market to be tested, makers have been booking tonnage at the new schedule and believe sufficient cheap tonnage has been booked recently to prevent serious shading of this quotation.

Will Not Import Bars

Eastern Makers Relieved of Fear of Early Competition From European Mills

Philadelphia, Aug. 3.—One effect of the general European war, which domestic producers of steel bars have foreseen, will be the killing off of their chances for importing foreign steel bars along or near by the coast and the removal of this question from the negotiations with buyers. While very few foreign bars actually have come in during recent months, the possibilities of importation has been considerably talked about. Mill representatives in this district report good specifications and the closing of considerable new contract business for the rest of the year. One seller in the week booked about 4,500 tons at 1.15c, Pittsburgh basis, or 1.30c, Philadelphia, which is the firm market at present.

Firm at Pittsburgh

Pittsburgh, Aug. 4.—The 1.15c figure for bar steel at this center is being firmly held, and no reports of shading are heard in this district. New orders and specifications in July ran ahead of those taken in June, several leading makers report. Although reports vary as to the extent played by agricultural implement makers in the recent buying movement, those in close touch with the situation say that the great bulk of this tonnage for the 1914-15 year has been placed. Bar iron is quiet and unchanged in position.

Specifications Good

New York, Aug. 3.—Fairly favorable specifications against contracts with consumers in this district generally are reported by bar makers. New business is not very extensive, but where fresh transactions are being closed, they manifest a firm condition of prices at 1.31c, New York, or 1.15c, Pittsburgh.

Hold Advance

Chicago, Aug. 4.—Makers and sellers of steel bars in this territory are maintaining the advanced prices announced 10 days ago. No indications are found that any one is selling at 1.28c, Chicago, and all the leading mills are insisting on 1.33c, Chicago, on all new business. As a result of the advance in quotations, business is not large, but the leading interest reports last week exceeded the preceding week in tonnage and each was larger than the second week back.

Specifications continue to be re-

(*For complete prices see page* 270.)

ceived in considerably increased volume and apparently every one holding a contract for bars at the price of 1.28c, Chicago, through third quarter, will specify his full tonnage before than period has closed.

Agricultural implement buyers have not come into the market with a rush at any time, but it is felt that practically all have covered for their requirements to July 1 next at the prices determined some weeks ago.

Hoops, Bands and Shafting

Pittsburgh, Aug. 4.—Quotations below 1.25c, for steel hoops, which were rather general the early part of July, have been withdrawn, and today's market is quotable at that figure. Bands are being held at 1.15c. Demand for cold rolled shafting has been better the last fortnight than previously, and prices have showed less irregularity. The Republic Iron & Steel Co. has renewed operations in its shafting department, which was idle several weeks.

Iron Bars Hold Position

Chicago, Aug. 4.—Iron bars continue to hold the higher level taken last week, and while business is not brisk, no difficulty is experienced in obtaining prices all the way from 1.05c to 1.10c, Chicago mill. Tonnages with especially attractive surroundings can command 1.05c, while ordinary business is being booked at 1.07½c to 1.08c, Chicago.

Some Improvement in Bar Iron

Philadelphia, Aug. 3.—The bar iron market with eastern Pennsylvania mills continues slightly broader. Bookings and operations have moved up a little, but prices have not been altered and remain from 1.15c to 1.22c, Philadelphia, on common bars, equivalent to 1.10c to 1.15c, mill.

Scrap Slightly Improved

In Eastern Pennsylvania, Where Railroad Lists Are Heavier

Philadelphia, Aug. 3.—The changes in the eastern Pennsylvania scrap market the past week have been for the better. An eastern Pennsylvania steel maker, at a highest freight point, paid $10.75, delivered, for several thousand tons of heavy melting steel. This price is somewhat higher than the market indicated a week ago. A leading buyer took a fair lot of wrought pipe at $10, delivered, and is inquiring still. No. 1 railroad wrought, which has been in poor demand, is stronger, one buyer offering $12, delivered, for 1,000 tons. More interest in their requirements is shown by other consumers, though generally there has been no revived buying. A lot of 3,000 tons of locomotive steel is offered in the market. Eastern railroad lists for August are heavier, that of the Pennsylvania railroad being 4,000 to 5,000 tons greater than usual.

Awaiting Developments

Buffalo, Aug. 4.—Dealers and consumers alike in the Buffalo territory are awaiting developments regarding the effect of the European war situation on business. No change in prices has occurred in the past week, but a tendency to stiffen is reflected in the character of the trading within the past few days. Dealers are confining transactions to a 30-day limit on deliveries at present prices. There is a local demand for old car wheels, which continues quite active. Railroad malleable is reported slightly weaker.

Avoiding Speculative Risks

New York, Aug. 4.—Business in old material among dealers and brokers in metropolitan territory is practically at a standstill. There is general reluctance to assume speculative risks under present uncertainties and the market is very narrow, as the buyers, too, are manifesting similar caution. Carloads and small sales make up the going business. About 1,000 tons of scrap from the demolishment of the old Western Union building in this city, have been awarded.

Scrap Still Dragging

Pittsburgh, Aug. 4.—The iron and steel scrap market at Pittsburgh continues to drag along at a slow rate, and little or no interest is taken in offerings. Heavy melters were well supplied with material, and probably will not figure in the market for several weeks. Prices of most grades are nominal.

Loses Strength

Chicago, Aug. 4.—Iron and steel scrap in this market apparently occupies a weaker position than last week, although the market has lacked strength for a longer time. The slight buying activity manifested 10 days ago has flattened out and several items are weaker than before it started. No indications are found to argue returning strength and comparatively little tonnage is moving, as consumers are not anxious to take on tonnage and dealers are not pushing for sales. Railroad lists now before the trade are as follows: Wabash, 850 tons, C., P. & St. L., 600 tons.

Drags at Cincinnati

Cincinnati, Aug. 4.—The iron and steel scrap market continues to drag along without any change either in demand or prices. Dealers have been making efforts to secure business by offering concessions, but these have had no result. Users of scrap in this territory are well supplied, and the surplus in dealers' yards and throughout the rural districts is gradually assuming large proportions.

Railroad Lists

St. Louis, Aug. 3.—The Wabash Railroad Co. at St. Louis is out with a list of 900 tons of scrap to be closed Thursday, and the Missouri Pacific closed one today for 2,000 tons. With these exceptions, scrap iron is very dull. Prices are unchanged from last week.

Tin Shortage

May Result in Closing Some Tinplate Mills

Pittsburgh, Aug. 4.—The serious situation abroad, threatens to indefinitely suspend shipments of tin to this country, and mills will be affected if cut off from their source of supply for any length of time. Pig tin since last Thursday has advanced from 31c to 55c a pound. So far as can ascertained at this point, the more important makers have enough material on hand to meet needs for six weeks or longer, but smaller mills, not able to invest heavily in tin, may have to close down plants in the near future. Although prices of finished products are expected to advance, quotations have not shown any strength as yet, material selling at minimum figures yesterday. Nothing but tonnage for immediate shipment will be accepted by mills in this district.

New Orders For Wire Light

Pittsburgh, Aug. 4.—The wire market is quiet, so far as new business is concerned, but specifications against contracts are coming out in rather good volume. Leading makers are holding firmly to advanced quotations, but prices will not be severely tested until jobbers have specified fully against old contracts.

(For complete prices see page 270.)

Shipyards Figure on New Work

Which Will Require Large Tonnages of Plates—Scarcity of Freight Vessels Expected to Result in Orders for American Plants

Philadelphia, Aug. 3.—Eastern ship yards are figuring at present upon a considerable amount of new construction and one builder reports prospective work before him requiring about 20,000 tons of plates and about 10,000 tons of shapes. Some of this work has been pending for some time. The opinion is expressed in eastern ship yard circles that the scarcity of freight bottoms growing out of the European war, should stimulate new construction in this country. Some of the eastern Pennsylvania plate mills now are doing better in the tonnage entered for rolling. One mill received specifications for more than 100 per cent output in the week. The demand is very miscellaneous, but there is a better tonnage of bridge work. Some eastern producers are standing firmly for 1.30c, Philadelphia, or 1.15c, Pittsburgh, on the usual run of business. A tonnage of attractive size, however, would be a matter of special negotiations, and 1.25c, Philadelphia, or 1.17½c to 1.20c, eastern mill, probably could still be done.

Battleship Bids are Asked

New York, Aug. 4.—It is announced that the date of the taking of bids by the government for the construction of the new battleships California, Idaho and Mississippi has been fixed as Oct. 6. Two of these vessels will be built in private and one in government yards. It is estimated that each will require about 15,000 tons, largely plates, apart from the armor plate. The plate market at New York still shows some low prices, a quotation of 1.26c, delivered, by a mill taking less than the Pittsburgh freight, having failed to obtain an order for 2,000 tons about a week ago. Eastern mills in quoting 1.26c, New York, are netting from 1.15c to 1.16c, at the plant, and to meet this figure Pittsburgh makers would be obliged to go to 1.10c.

Plates Holding Well

Pittsburgh, Aug. 4.—So far as can be learned at this center, steel plates are being firmly held at 1.15c, although the Pittsburgh basing price continues to be disregarded at other centers, which has been the rule for several months. Specifications and new orders in July involved more tonnage than those received the preceding month. Makers have started to reef sails somewhat, on account of the situation abroad, and mills are avoiding extended deliveries so far as possible.

Continue Slow

Chicago, Aug. 4.—Although other finished steel products have picked up somewhat, both as to new business and specifications on existing contracts, plates have not gained as much as shapes and bars. While no especial reason is apparent for a difference, it is a fact that plates have been somewhat slower and weaker throughout this year and the difference is still maintained. Such tonnages as are being disposed of, however, are on a basis of 1.33c, Chicago, for last half. Specifications against old contracts have increased somewhat, but not to the same extent as in other products.

Cleveland Mills Busy

Cleveland, Aug. 4.—Plate mills in Cleveland are now running at their full capacity and are better supplied with orders than for some time. The new quotation of 1.15c, Pittsburgh, on plates is not being adhered to and 1.10c, Pittsburgh, or 1.20c, Cleveland, is the usual quotation.

Tightened Money Market

Causes some Trouble for Builders—Very Few Contracts Awarded

New York, Aug. 4.—New inquiry for structural work has slumped sharply in the metropolitan district, which is largely attributed to the contraction of loans due to the unusual financial situation that has arisen. This tightness of loans is in decided contrast with conditions of a week or more ago, when a more liberal attitude in this direction was being shown by the banks, and insurance companies and work in the speculative class such as apartment houses and loft buildings had been greately stimulated. The shape market at New York has not changed in price. Orders still are being taken rather freely by eastern mills at 1.26c, delivered, equivalent to 1.16c to 1.18½c, eastern Pennsylvania mill. On a Pittsburgh basis, these prices figure back to 1.10c.

Good Orders at Old Prices

Philadelphia, Aug. 3.—Large orders for structural shapes may still bring out a price of 1.25c, Philadelphia, or 1.17½c to 1.20c, eastern Pennsylvania mill. On a Pittsburgh basis, for eastern delivery, this would be equivalent to 1.10c. On smaller orders, 1.30c and even 1.35c, Philadelphia, is being obtained. Better specifications generally mark the shape situation with eastern mills. July's tonnage was considerably ahead of June. One mill reports its operations at present as 80 per cent. New business the past week has been rather light. Some ordinary replenishments are going forward, but there is no disposition among buyers generally to stock up.

Advance at Buffalo

Buffalo, Aug. 4.—As a counter-note to the war call of Europe, one of the principal interests reports that its Buffalo office is figuring at the present time on a greater number of new undertakings, requiring a large aggregate of structural steel, than has come out for estimates and bidding in a long time. The first effect on the trade of the actual declaration of war between the great European powers has been to cause the withdrawal of the 1.15c base price and the asking of an advance of $1 a ton. Some interests look for further increases to take place, if the conflict abroad is protracted. Specifications are keeping up to July, a nominal dull month, and equal in volume to June. Many new inquiries continue to come in for structural material going into various types of construction, large and small, throughout the territory.

Tentative Award

Cleveland, Aug. 4.—Very little new business is developing in structural material in the Cleveland district and old projects are dragging. The controversy with the commissioner of buildings with regard to the revised plans for the Bingham warehouse has not yet been settled, but the contract for the shapes has been awarded ten-

(For complete prices see page 270.)

tatively by the general contractor, the Crowell-Lundoff-Little Co., to the McClintic-Marshall Co. About 1,500 tons will be required. No action has been taken in regard to the 2,100 tons of reinforcing bars.

The county commissioners have declined the request of P. T. McCort, Akron, O., to be relieved from entering into the contract to build the Brooklyn-Brighton bridge at his bid of $438,811 and he has been notified that unless he makes the contract by Aug. 12, his bond of $10,000 will be forfeited.

Quiet at Pittsburgh

Pittsburgh, Aug. 4.—The structural market at Pittsburgh has been quiet this week, although prices have been firmly held, and numerous small orders have been placed. No important structural undertakings have come up for consideration in the immediate district.

Shape Prices Hold

Chicago, Aug. 4.—No difficulty has been experienced in maintaining the new schedule of 1.33c, Chicago, for structural shapes, although some contractors were caught by the increase in having made bids at a lower level.

Contracts let the past week in western territory were for small tonnages and varied mercantile purposes.

CONTRACTS AWARDED.

Paducah & Illinois Railroad Co., Metropolis bridge, Metropolis, Ill., 18,000 tons, to the American Bridge Co.

Office building for Kate Nixon, Reno, Nev., 300 tons, to Ralston Iron Works.

Independent Baking Co., building, Davenport, Ia., 288 tons, to Rochester Bridge Co.

Duluth, Missabe & Northern Ry. Co. connecting trestle, supporting trimmer's house between ore docks No. 4 and No. 5, Duluth, Minn., 251 tons, to the American Bridge Co.

Sixth street pier, Hoboken, N. J., 900 tons, awarded to McClintic-Marshall Co.

Warehouse for Newport Rolling Mill Co., Newport, Ky., 800 tons, awarded McClintic-Marshall Co.

Two-story addition to machine shop at East Pittsburgh and foundry building at Wilmerding, Pa., for Westinghouse Electric & Mfg. Co., Pittsburgh, 900 tons, awarded to Jones & Laughlin Steel Co.

Bingham warehouse, Cleveland, 1,500 tons, to McClintic-Marshall Co.

Armory at Alston, Mass., 700 tons, awarded New England Structural Co.

Three apartments for Bing & Bing, at Ninety-second and Ninety-third streets, New York City, 2,000 tons, awarded Passaic Structural Steel Co.

Horatio apartment house, Fifty-fourth street and Park avenue, New York City, 500 tons, awarded Belmont Iron Works.

Apartment houses for Paterno Bros. at Eighty-fourth street and Broadway, New York City, 1,800 tons awarded American Bridge Co.

Addition to Transit building, Forty-third street, New York City, 700 tons awarded to American Bridge Co.

CONTRACTS PENDING.

Coal Piers at Charleston, S. C., 700 to 800 tons. Bids being taken.

Five apartment houses for Kiel interests at 193rd street and Webster avenue, New York City, 800 tons. Bids being taken.

Bridge at Anderson street, Allegheny, Pa., for Pennsylvania railroad, 500 tons. Bids being taken.

New City Hall, Niagara Falls, N. Y., bids soon, taking about 300 tons.

C. F. Ernst's Sons Co., Buffalo, low bidders, Polish Union building, Buffalo, taking 200 tons.

W. R. Hearst building Sixty-first street and Broadway, New York City, 700 tons. Bids being taken.

Addition to Pictorial Review building, Thirty-eighth street, New York City, 800 tons. Bids being taken.

Vessels to Haul Rails

Are Badly Needed in Order to Obtain Export Business For American Mills

New York, Aug. 4.—Considerable export business in rails is open to domestic makers at the present time, and it is believed that if proper vessel accommodations could be obtained, the chances for these orders coming to this country would be favorable. Among the inquiries now before the mills are 28,000 tons for the Victorian Government Railways, about 10,000 tons for Chile and smaller lots. An inquiry for 5,000 tons or more for Russia has been nullified by force of circumstances. Deliveries upon a recent order for 12,000 tons of rails taken by the Pennsylvania Steel Co. for Queensland have been held up owing to the difficulty of obtaining boats for the transportation of this material.

In domestic rails, the Chesapeake & Ohio railroad is expected to place orders shortly for 15,000 tons and the Baltimore & Ohio railroad has about 15,000 tons additional to distribute. The Bethlehem Steel Co. and the Lackawanna Steel Co. will divide an order for 2,600 tons of contract rails for the Interborough Rapid Transit Co. of New York. The Municipal Railways Corporation, of New York, has not yet awarded 15,000 tons of the same class.

The effect of the railroad rate decision upon railroad buying has been negligible. It is a question in the minds of many whether the influence of the decision as rendered would have been different even had conditions not been greatly complicated by the war disturbances. Equipment builders have seen no great encouragement for them in the result as to the immediate stimulation of car buying. Car orders of the week were about 1,100, including 600 for the Erie and 500 for the Lackawanna road. A new inquiry calls for 2,000 cars for the Cincinnati, Hamilton & Dayton.

Total orders for cars placed in July were about 8,000 compared with 16,500 in June, 6,000 in May, 10,500 in April, 7,500 in March, 9,000 in February and 13,000 in January or a grand total of about 70,000 in the year to date. July rail orders not including the final allotment of the Pennsylvania which was practically closed in June were about 130,000 tons against 215,000 in June, 110,000 in May, 60,000 in April, 61,500 in March, 215,000 in February and 175,000 in January.

(*For complete prices see page 270.*)

Car Inquiry is Out

Chicago, Aug. 4.—The C., H. & D. railway is in the market for 1,000 box cars, 1,000 gondolas and about 50 passenger cars.

CAR AND LOCOMOTIVE ORDERS.

The Baltimore & Ohio railroad is inquiring for 1,000 box, 1,000 hopper and 29 passenger cars, for the Cincinnati, Hamilton & Dayton railroad. It also is reported to be considering 2,000 hoppers for its own line.

The Pittsburgh & Shawmut railroad has ordered 25 box cars from the American Car & Foundry Co.

The Delaware Lackawanna & Western railroad has placed 500 gondolas with the Pressed Steel Car Co.

The Erie railroad has divided 600 hopper cars equally among the Pressed Steel Car Co., the Standard Steel Car Co. and the American Car & Foundry Co.

The San Diego & Arizona railroad has ordered one consolidation freight locomotive from the American Locomotive Co.

The Cincinnati Car Co., Cincinnati, has received an order for four interurban steel cars from the Pennsylvania & New Jersey Traction Co.

Effect of War

Felt in Tubular Goods Market — Some Orders Held Up

Pittsburgh, Aug. 4.—Announcement that interruption of foreign commerce resulting from the European war has made it necessary for the Standard Oil Co. of New Jersey to curtail the output of all petroleum products, has had some effect upon the market for tubular goods. Requests have been received by makers to either cancel orders or suspend shipments of material to be used in oil well projects.

Demand From Gas Fields

Demand for pipe for the gas fields, however, has not fallen off and several attractive inquiries are before the trade. The market for boiler tubes continues dull.

MEN OF THE IRON TRADE

Who they are Where they are What they are doing

Many prominent iron and steel manufacturers are now in Europe and some of them will doubtless be detained considerably longer than they expected to stay abroad.

Samuel Mather, of Pickands, Mather & Co., Cleveland, and his brother, William G. Mather, president of the Cleveland-Cliffs Iron Co., Cleveland, are in England. They had planned to return on the Olympic, of the White Star Line, leaving Southampton Aug. 19.

Matthew Andrews, member of the

W. H. CADWALLADER
General Manager Union Switch & Signal Co., Pittsburgh

firm of M. A. Hanna & Co., Cleveland, returned from Europe last Saturday, accompanied by Mrs. Andrews.

A. W. Hitz, superintendent of the Newburg wire mill of the American Steel & Wire Co., Cleveland, is in Germany, accompanied by Mrs. Hitz.

Chairman E. H. Gary, of the Steel Corporation, and Mrs. Gary, are among those Americans now in Europe to whom the return trip to this country has been made more difficult by the war situation. The Garys have been in Paris during the past week. When Judge Gary sailed some weeks ago, he planned to return in September. J. G. Butler Jr., Youngstown, O., is another prominent iron and steel man now abroad. He was planning to return upon the Kronprinzessin Cecile due at New York, Aug. 6.

S. A. Cochran, member of the firm of Frank Samuel, Philadelphia, is ill at his home in Roxboro, Pa.

A. L. Nash, of Crocker Bros., New York City, who has been abroad for the past month, returned July 29.

O. J. Patzold has been appointed sales manager of La Follette Coal, Iron & Railroad Co., with offices at the mines in Tennessee.

William D. Krafft, secretary and treasurer of the Baldwin Locomotive Works, who has been abroad for the past two months, has returned.

E. G. Felthousen, president of The Acme Steel & Malleable Iron Works, Buffalo, is spending a few weeks in Michigan on an automobile trip.

A. M. Mueller, for several years assistant manager of sales in Chicago for Joseph T. Ryerson & Son, will be in charge of the newly acquired St. Louis plant as resident manager.

T. H. Edwards has been appointed superintendent of the steel department of the Wheeling Steel & Iron Co., Wheeling. He was formely superintendent of the Bessemer department of the Colorado Fuel & Iron Co., Pueblo, Colo.

W. H. Cadwallader has been appointed general manager of the Union Switch & Signal Co., Pittsburgh. He has served as assistant general manager for more than a year. Mr. Cadwallader began his connection with the Signal company 24 years ago as an office boy.

B. R. Shover has resigned as general superintendent of the open-hearth plant of the Brier Hill Steel Co., Youngstown, O., effective Aug. 1, since which date all heads of departments have reported to R. C. Steese, vice president and general manager. Mr. Shover has definite plans but is not yet ready to announce them.

W. C. Schade has been appointed general manager of the Phoenix Iron Works Co., Meadville, Pa., and will take charge of the affairs of the company on Aug. 15. He resigned as president of the Cherry Tree Iron Works, Cherry Tree, Pa., in February this year, but his resignation was not accepted at that time.

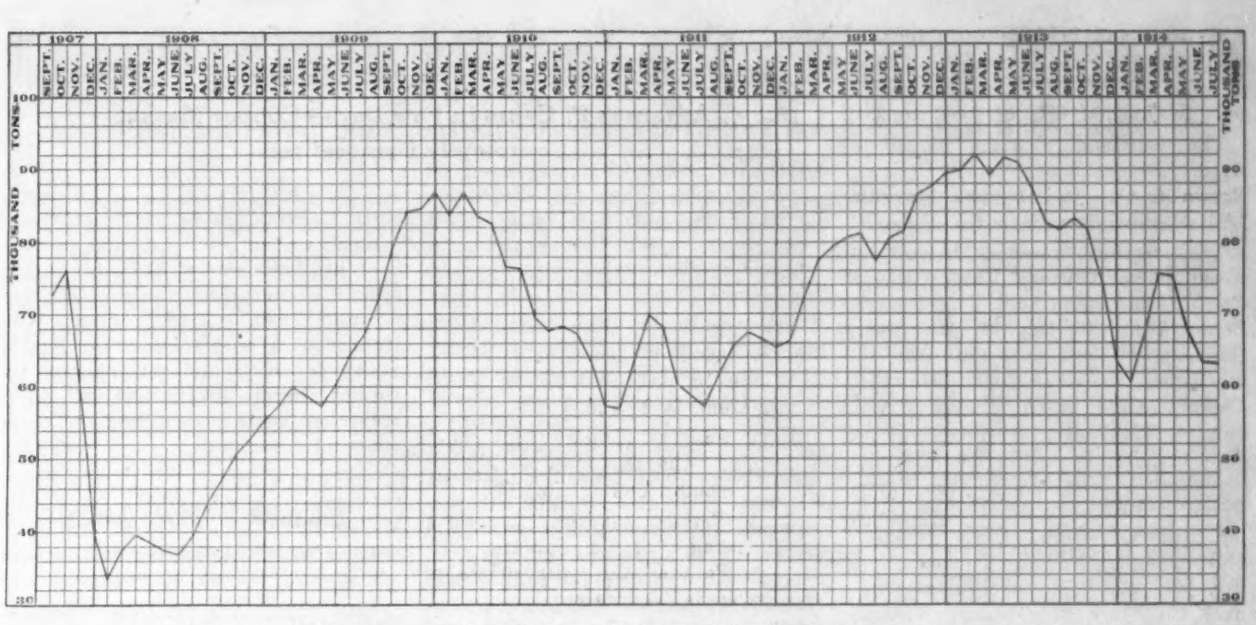
Bert J. Ross, manager of the Clarksburg plant of the Phillips Sheet & Tin Plate Co., at Clarksburg, W. Va., has resigned according to an announcement at that center. He was formerly with the American Sheet & Tin Plate Co., at Sharon, Pa., and more recently with the Jones & Laughlin Steel Co., at its Aliquippa plant at Woodlawn, Pa.

Charles Frederick Quincy, a newly elected member of the American Iron and Steel Institute, is president of the Q. & C. Co., dealer in railway ma-

C. F. QUINCY,
New Member American Iron & Steel Institute

terials, 90 West street, New York. Mr. Quincy was born in Newton, Mass., July 16, 1856, and is a graduate of the Newton high schools. He is a member of the American Society of Civil Engineers, and president of the Quincy & Manchester Co. and Quincy & Gilman Engineering Co.

Orton Lee Prime has resigned as president and general manager of the Prime Steel Co., open-hearth and crucible steel castings, Milwaukee, Wis., and will devote his entire attention to his new enterprise, the Prime Mfg. Co., Railway Exchange building, Milwaukee, railway supplies. Charles E. Nelson, a steel casting expert, until now located at Waukesha, Wis., has been elected president of the Prime Steel Co. to succeed Mr. Prime.



Average Daily Production of Coke and Anthracite Pig Iron

Eleven Merchant Stacks Go Out

While producers of merchant iron were blowing out furnaces last month, owners of steel works or non-merchant stacks were placing their plants in operation. As a result, while there was a large decline in the number of active furnaces, pig iron production for July practically was unchanged from June.

The total output of coke and anthracite pig iron in July was 1,958,267 tons, compared with 1,904,566 tons in June, an increase of 53,701 tons. This gain, however, was the result of the longer month, as in average daily production June led with 63,486 tons, against an average output of 63,170 tons in July. The loss in average daily production was 316 tons.

Thirteen merchant furnaces were blown out during July, while only two were relighted, a net decline for the month of 11. Offsetting this decrease, eight steel works furnaces were blown in and three were blown out, a net gain for July of five. The complete list of active stacks consequently reveals a net decrease of six for the month, 10 going in blast and 16 blown.

The number of stacks in blast July 31 was 187, the smallest total since Aug. 31, 1908. There were 193 in blast on June 30. With the exception of January of this year, the average daily output was the lowest of any month since August, 1911. Excepting January, February and June of this year, the total output was the smallest of any month since August, 1911.

The steel works showed a gain in both total production and average daily output in July. The production of non-merchant iron was 1,397,186 tons, against 1,331,486 tons in June, a gain of 65,700 tons. In average output, the figure for July was 45,071 tons; in June, 44,383 tons, a gain of 688 tons. The merchant furnaces produced 544,387 tons in July and 556,826 tons in June, a loss of 12,439 tons. Their average output in July was 17,561 tons and in June 18,561 tons, a loss of exactly 1,000 tons.

The output of spiegel in July was

MONTHLY PRODUCTION.

	1914.	1913.	1912.
January	1,879,336	2,787,800	2,052,806
February	1,888,607	2,578,670	2,098,796
March	2,341,551	2,762,823	2,411,529
April	2,261,501	2,754,353	2,377,621
May	2,097,019	2,816,825	2,503,341
June	1,904,566	2,616,883	2,433,737
Total 1st half	12,372,580	16,317,354	13,877,830
July	1,958,267	2,558,275	2,402,567
August	.....	2,537,018	2,500,163
September	.....	2,494,098	2,444,454
October	.....	2,539,924	2,683,645
November	.....	2,229,960	2,639,562
December	.....	1,976,138	2,777,292
Total 2d half.	.....	14,335,413	15,447,683
Grand total.	14,330,847	30,652,767	29,325,513

AVERAGE DAILY PRODUCTION.

	1914.	1913.	1912.
January	60,624	89,929	66,220
February	67,450	92,095	72,372
March	75,534	89,123	77,791
April	75,383	91,812	79,254
May	67,646	90,865	80,753
June	63,486	87,229	81,125
July	63,170	82,525	77,502
August	.....	81,839	80,650
September	.....	83,137	81,482
October	.....	81,933	86,569
November	.....	74,322	87,985
December	.....	63,746	89,590

JULY PIG IRON.

States.	No. of stacks.	No. in blast last day of month.		Total tonnage made.		——Totals——	
		July.	June.	Merchant.	Non-Merchant.	July.	June.
Pennsylvania	157	73	74	140,634	647,090	787,724	749,613
Ohio	73	38	42	99,649	344,684	444,333	432,229
Alabama	45	20	19	108,302	43,636	151,938	144,167
Virginia	22	6	7	24,317	.....	24,317	23,866
New York	26	13	13	70,251	48,898	119,149	126,839
New Jersey	7	2	2	10,825	.....	10,825	10,327
Illinois	26	12	12	33,004	142,814	175,818	169,056
Colorado	6	2	2				
Indiana	10	8	8				
Maryland	4	2	2				
Wisconsin	6	3	3	21,548	163,055	184,603	186,024
Kentucky	7	1	1				
West Virginia	4	1	1				
Tennessee	18	4	5				
Washington	1	0	0	20,195	7,009	27,204	31,087
Georgia	2	0	0				
Texas	3	0	0				
Minnesota	1	1	1				
Michigan	3	1	1				
Missouri	1	0	0	15,662	.....	15,662	15,104
Spiegel—All states						8,132	4,050
Ferro—All states						8,562	12,204
Totals	422	187	193	544,387	1,397,186	1,958,267	1,904,566

8,132 tons and in June 4,050 tons, a gain of 4,082 tons. Ferro production in July was 8,562 tons, against 12,204 tons in June, a loss of 3,642 tons.

The merchant furnaces blown in were: Susquehanna No. 3, Rogers, Brown & Co., July 10, and Mayville "A", Northwestern Iron Co., July 26.

The merchant furnaces blown out were: One Clifton, The Alabama Co.; Susquehanna No. 4, Rogers, Brown Iron Co., July 14; one River, Corrigan, McKinney & Co., July 17; Hamilton, Hanging Rock Iron Co.; Cherry Valley, M. A. Hanna & Co., July 4; Lawrence, Marting Iron & Steel Co., July 8; one Wellston, Wellston Steel & Iron Co., July 7; Perry, Perry Iron Co., July 17; Temple, Temple Iron Co., July 14, for relining; Hokendauqua No. 1, Thomas Iron Co., July 31; Princess, Princess Furnace Co., July 17; Thomas, Thomas Furnace Co., July 30, and Rockdale, J. J. Gray Jr., July 27.

Steel Works Furnaces

Steel works furnaces blown in were: Alabama City, Gulf States Steel Co., July 15; Ensley No. 6, Tennessee Coal, Iron & Railroad Co., July 30; Harriet "Y", Wickwire Steel Co., July 30; one Ohio, one Carrie and one Isabella, of the Carnegie Steel Co., all on July 23; Haselton No. 2, Republic Iron & Steel Co., July 24, and one Cambria, Cambria Steel Co.

Steel works furnaces blown out were: Lackawanna No. 6, Lackawanna Steel Co., July 18; Martins Ferry, Wheeling Steel & Iron Co., July 13, and Leesport, Leesport Furnace Co.

In announcing plans for August, the Emporium Iron Co. advised it would blow out its Emporium, Pa., stack on Aug. 3; the Northern Iron Co. advised it would blow out its Fort Henry furnace for relining, Aug. 3, while the Wisconsin Steel Co. will blow out its No. 2 furnace at South Chicago on Aug. 25 for relining and will blow in No. 1 furnace about Aug. 20.

General repairs will be made to the Princess furnace which went out of blast on July 17 and the stack will be ready to resume about Sept. 1.

Warehouse Trade Holds Its Own

New York, Aug. 4.—Warehouse trade in the metropolis is just about holding its own with the July market, according to leading companies engaged in the store business. The demand is neither active nor light. Prices are held at previous levels.

Price of Pig Tin Soars

Advances 27 Cents in Few Days—Copper Market Completely Demoralized

New York, Aug. 4.—The demoralizing effect of the European war is reflected more acutely in tin than in any other metal. With only three weeks' supply on hand, and a stoppage threatened in deliveries, the price went up from 31c last Saturday to 58c today. Buyers are in a wild scramble and there is very little tin for sale. Sales at the high prices have not involved more than perhaps 200 tons. To ease up the situation somewhat, the metal exchange has suspended all deliveries on contracts, except such contracts as call for deliveries before Aug. 10; and on contracts for named steamers, when delivery will become due upon the arrival of the steamers.

No Copper Quotations

This market also is completely demoralized by the European developments, which have led producers in this country to shut down half the producing capacity. No quotations are being made and it is absolutely impossible to gage the market. It seems certain, however, that the price is destined to go still lower than it was last week, when electrolytic was quoted at 12.87½c, delivered 30 days.

Coke Quiet

And Prices Weaker Than They Were a Few Weeks Ago

Pittsburgh, Aug. 4.—The Connellsville coke market continues quiet, and prices are not so strong as they were several weeks ago. Furnace fuel is being rather freely offered at $1.75, ovens, and some regard that figure as representing the bottom of the contract market. Foundry grades are not so active, but unchanged in position. The Connellsville Courier, for the week ending July 25, says production was 268,290 tons, an increase of 90 tons compared with the week before.

Stronger at Cincinnati

Cincinnati, Aug. 4.—The coke market is a little stronger, and prices slightly firmer. This is attributed to the fact that a general war in Europe might cause a serious shortage of labor in the coke fields, and also that a 5 per cent increase in freight rates on certain western railroads might be applied to coke, which is causing numerous melters to contract for long periods ahead. A better demand has been realized during the past week. A small amount of Pocahontas furnace coke has been sold at $1.75, ovens, for prompt shipment, but the general price is from $1.80 to $1.90, ovens. The Union Gas & Improvement Co. is still asking for 50,000 tons of coke for its various western plants, and will probably close some time during the present week.

Steel Products

Quoted With Regularity and Advances May Be Made

Pittsburgh, Aug. 5. (By wire.)—The regularity reflected by finished steel products in this district is regarded with a great deal of satisfaction by mill managers, who are watching developments more closely as the European situation assumes greater proportions. Sales managers and representatives, without exceptions, so far as can be learned, have been given instructions not to offer material for anything but immediate shipment, and some mills are not selling for any delivery until after accounts have been investigated.

Although no official information is obtainable, it is understood that some leading manufacturers are seriously considering an advance in prices of hot rolled products. Foreign competition is being almost entirely disregarded and mill managers do not expect to be brought in further competition with foreign mills until after the return of more normal conditions abroad. Although exports for the present have been cut off, the trade here does not expect to see any weakening on this account.

Will Build Viaduct.—Officials of the Sloss-Sheffield Steel & Iron Co., of the Louisville & Nashville and Southern railroads have signed the contract with the City of Birmingham for the erection of the big viaduct at First avenue and Twenty-seventh street, almost opposite the Sloss-Sheffield furnaces, work upon which is expected to begin within the next week or two. The cost is borne jointly by the Sloss company and the two railroads.

War Paralyzes Foreign Trade

President Farrell Summons All Americans to Unite Regardless of Past Differences to Establish a Merchant Marine

The National Foreign Trade Council has announced the appointment of a committee to consider ways and means of relieving the congestion of American foreign commerce due to the European war and consequent contraction of shipping facilities. The committee will consist of James A. Farrell, of New York, president of the United States Steel Corporation, chairman; James J. Hill, of St. Paul, chairman of the board of the Great Northern Railway; Edward N. Hurley, of Chicago, vice president of the Illinois Manufacturers' Association; P. A. S. Franklin, of New York, vice president of the International Mercantile Marine; Captain Robert Dollar, of San Francisco, president of the Robert Dollar Steamship Co.; J. A. G. Carson, vice president of the Savannah, Ga., Board of Trade; Alba Johnson, of Philadelphia, president of the Baldwin Locomotive Works, and Willard Straight, of New York, president of the American Asiatic Association.

All the members of the committee are engaged in shipping or some phase of the export trade. In view of the urgency of the situation, their conferences will be initiated by telegraph. Mr. Farrel said:

"Although the United States is politically isolated from the European war, our foreign commerce is paralyzed, at this juncture, through lack of vessels in which our exports may be safely and economically carried. The congestion of grains, foodstuffs and manufactures at American seaports, the multiplication of interest, storage charges and insurance creates a burden which reacts upon all industry, particularly the agricultural community. It is impossible under existing conditions to carry on business with the principal oversea markets due to withdrawal of vessels under foreign flags ordinarily available for transportation of American products. War risks on foreign bottoms have reached prohibitive figures.

"This crisis should bring home not only the necessity of providing an adequate American merchant marine, but also the importance of subordinating partisan and sectional differences as to practical methods of accomplishing it. The administration at Washington is moving with commendable activity in the emergency, and the time is ripe for a nation-wide expression of opinion on this vital question and co-operative action by commercial and industrial bodies throughout the country."

The National Foreign Trade Council was created by the National Foreign Trade convention at Washington in May. Its object is to co-ordinate the foreign trade activities of the nation. Its 35 members consist of nationally representative manufacturers, railroad and steamship men, merchants and bankers, who collectively stand for the general interest of all elements engaged in or affected by foreign trade.

Call to Arms

Not Likely to Cause Many Eastern Workmen to Leave Plants

Philadelphia, Aug. 4.—Steel works and blast furnaces in the eastern Pennsylvania district, it is indicated, are not likely to be seriously affected by the withdrawals of foreign workmen to answer the call of war of their native lands in Europe. At the present time, these plants are active at only part capacity; in fact, under recent conditions the supply of common labor such as largely would be drawn against has been in excess of the need and there has been a surplus. Although the number of foreign workmen employed in these plants is quite large in the aggregate, at no single works, apart possibly from those at South Bethlehem and Steelton, is the force so big that heavy losses could not be sustained without seriously affecting operations, especially under prevailing trade conditions. So far, there has been no appreciable number of departures of men from these works. In the anthracite coal regions and in the eastern Pennsylvania Portland cement industry, however, the percentage of foreign unskilled labor is large and in these cases more serious results may attend a general exodus of the workmen who will respond to the call to the colors. Some of the large coal companies do a big business in coaling ocean-going steamships. This class of demand promises now to be greatly curtailed, so that in many cases the mines will not be called upon for full output.

Outlook For Trade Encouraging

Charles E. McInnes & Co., iron and steel dealers, 30 Church street, New York, have their representatives now travelling in Japan and China. Mr. Moyer, representing the firm, cables that business conditions are good in Japan and China and the outlook for business with these countries is very encouraging.

Like the American Plant

Washington, Aug. 4.—Following an inspection of practically all the plants of the small-arms ammunition manufacturers of the world, a firm at Budapest, Hungary, has reached the conclusion that the Frankford arsenal, Philadelphia, is superior to all others. Gen. Crozier, army chief of ordnance, has received a letter from the firm announcing this fact. The letter asks if some arrangement cannot be made whereby the war department will sell a duplicate of the Frankford arsenal plant. Not being in the business of manufacturing machinery, the department informed the correspondent that it could not furnish it any machinery. The superiority of the army plant is held to be due largely to its automatic features. Raw material is fed in at one end of the machine and comes out a finished product at the other. Very little of the work is done by hand.

Delay Call For Bids

Washington, Aug. 4.—It will be at least two weeks before the bureau of yards and docks, navy department, will invite bids for a 150-ton floating crane for the Norfolk, Va., navy yard. The first appropriation for this equipment was made two years ago, but no action was taken pending determination of the type of crane. The new naval appropriation bill increased the limit of cost from $300,000 to $450,000.

The Engineers' Society of Western Pennsylvania will make an excursion from Pittsburgh to Ambridge, Pa., on Saturday Aug. 8, for the purpose of inspecting the 1,000-foot arch span for the Hell Gate bridge, including the four end panels of one of the arch trusses which have been completely assembled on the ground for reaming the field connections.

Great Britain's Action Will Help

In Forwarding Shipments—President Farrell Makes An Important Statement

New York, Aug. 5. (By wire.)—President Farrell today made an important statement to THE IRON TRADE REVIEW.

"With the declaration of war by England, the situation has cleared in many respects, because greater protection is assured to owners of vessels in the transportation of cargoes," said Mr. Farrell. "The action taken yesterday by the British government in guaranteeing war risks of vessels transporting foodstuffs and other commodities will facilitate exports. No one can foresee what the full effect upon the steel business of this country is going to be. Certain it is, steel imports from Europe will cease, and with the passing of the necessary legislation by our government, a number of additional vessels will be brought under the American flag, and I believe there will be a gradual resumption of exports, which will assist in restoring the equilibrium of foreign exchange and relieve the congestion of merchandise in transit at seaboard.

"In view of the general uncertainty attached to the importation of ferro-manganese and other metals, the exportation of which has been embargoed by many foreign countries, it would seem that the question of conserving the supplies as far as possible will have to be considered, rather than the continuing of selling products at the unremunerative prices recently prevailing.

"Prices on all iron and steel products are likely to be affected, and quotations made on actual current business. I do not look for any unusual advance in prices, but rather a recurring to normal values more commensurate with the increased cost of production. The fundamental conditions of the country are sound and point to an increase in domestic business."

All Prices

Are Withdrawn by the United States Steel Corporation

New York, Aug 5. (By wire.)—The conditions of the leading steel makers, in view of present uncertainties involving dangers of shortage in raw materials, such as tin, ferro-manganese, etc., cause them to conserve their supplies for the moment and to sell very cautiously.

The Steel Corporation last night withdrew all prices and is quoting only on application, any new business being taken at $1 higher than previous orders. If demand continues, further advances are indicated. Present conditions have removed the menace of iron and steel imports, particularly on the Pacific coast, for which domestic manufacturers have restored former prices. This is equivalent to about $3 a ton.

The bookings of the Steel Corporation have been well maintained, despite the disturbed market, and one day this week new orders were received in excess of 50,000 tons. New business in July averaged 40,000 tons daily, and that month will show an increase of about 200,000 tons in the orders booked. The Corporation rail orders of the week were about 50,000 tons, including 25,000 tons for Carnegie Steel Co., 20,000 tons for Illinois Steel Co. and 2,000 tons for the Tennessee company, all made up of small lots.

Many Cases

Will Be Investigated at Pittsburgh Hearings

Washington, Aug. 5. (By wire.)—E. C. Cormalt, counsel and special examiner from the office of Chairman Harlan of Interstate Commerce Commission, leaves here tonight for Pittsburgh where he will hold a conference with steel and railroad men to arrange for hearings in fall regarding numerous cases. These include investigation of ore rates from lake to western Pennsylvania. Ohio and West Virginia rates on finished and semi-finished steel products from Pittsburgh to southern and western points including new and reopened cases and rates on slag from Pittsburgh and valleys.

Ferro Supply

May Be Very Short—Tin Outlook Not So Serious

Pittsburgh, Aug. 5. (By wire.)—By far the most serious problem faced by domestic manufacturers, according to veteran mill men here is that concerning the future supply of ferro-manganese, but no definite insight into this situation appears to be obtainable during present complicated conditions.

Consumers of pig tin profess to believe that that department of the market will take care of itself in due time, but it is probable that the smaller tin plate mills will have to close if the scarcity becomes more acute. Tin sold at high as 58 cents a pound at New York yesterday, according to early morning reports here. Sellers were asking 31 cents a pound when the exchange closed last Thursday.

President George Gordeon Crawford, Birmingham, of the Tennessee Coal, Iron & Railroad Co., is spending his vacation in the east.

Vice President John W. McQueen, Birmingham, of the Sloss-Sheffield Steel & Iron Co., has been spending a few days in a fishing and vacation trip on the gulf coast.

THE ABC OF IRON AND STEEL

Making Steel Castings--I

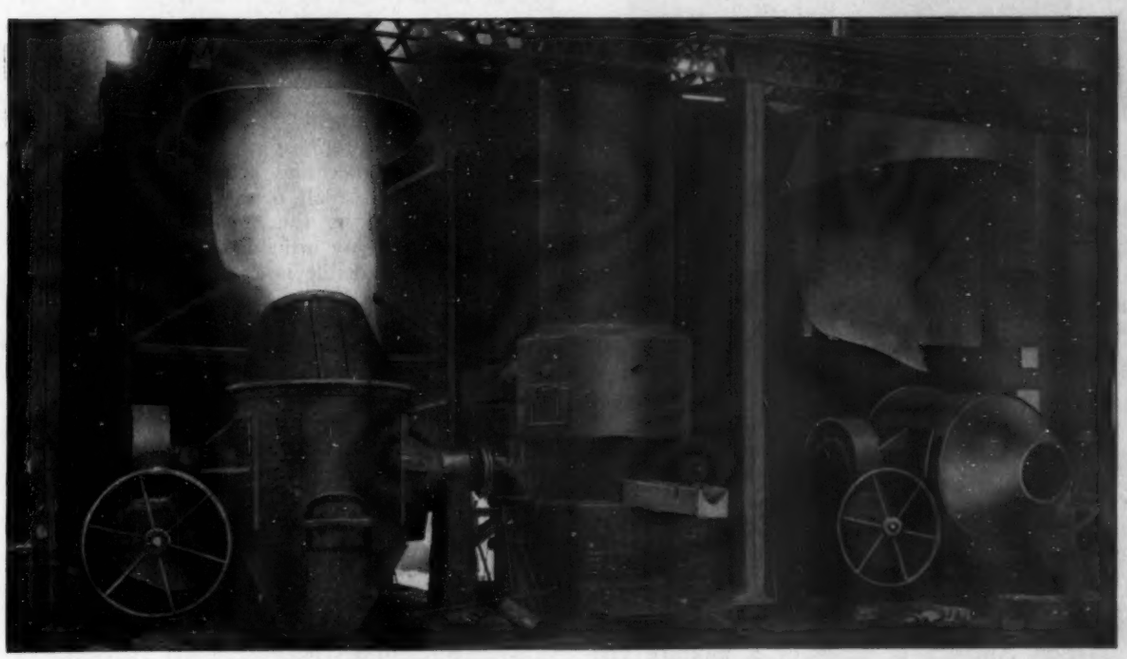
BY R A BULL

THE subject to be discussed is so broad, and the processes involved are so complex, that it is not possible in the scope of a treatise of moderate length to describe all the details of production. We will pre-suppose a knowledge of the commonly understood and comparatively simple art of making gray-iron castings, and touch upon as many of the operations followed in steel casting plants in contra-distinction, as space and sense of due relation will permit. In thus condensing, we may seem to give disproportionate attention to certain phases of steel foundry practice. Perhaps only those who have attempted to treat with brevity subjects involving countless details can make charitable allowances for such deficiencies, which will doubtless be apparent.

Coupled with the difficulty of brief description is that which attaches to lack of personal experience. Steel founders at least will admit the impossibility of attaining in one man's lifetime an intimate personal knowledge of all operations involved in the production of steel castings. With perfect candor the writer confesses that he has collected and collated data from various sources to supplement his personal knowledge of the business. His own experience is only the basis for most of what will follow. He thinks that to be dependable and believes information secured from others reliable—but disclaims infallibility for either.

The name of the city of Sheffield in England

The following articles of this series previously have been published in THE IRON TRADE REVIEW: "Iron Ore and Mining Operations," Jan. 5; "Beneficiating Iron Ores," Feb. 2; "Rules for Figuring Penalties and Premiums on Lake Superior Iron Ores," March 9; "Transportation of Iron Ore on the Great Lakes," March 16 and April 13; "Ore-Handling at Lower Lake Ports," Oct. 12, 1911; "The Manufacture of Bee-Hive Coke," Jan. 4, 1912; "Pig Iron and Its Method of Manufacture," Jan. 2; "Manufacture of Wrought Iron," Feb. 6; "Manufacture of Crucible Steel," April 3 and April 10; "Manufacture of Open-Hearth Steel," May 15, 22 and 29, June 5 and 12; "The Rolling Mill Industry," Aug. 7, 14, 21 and 28; "Wire and Wire Rods," Oct. 2, 9, 16, 23 and 30, 1913; "Making Bessemer Steel," May 21, 1914.



A CONVERTER INSTALLATION IN A STEEL FOUNDRY

is associated in everyone's mind with the manufacture of steel. Appropriately enough, it was there that the making of steel castings can be said to have originated through the development of the crucible furnace, much as it remains today, by Benjamin Huntsman, a clockmaker, in 1740. Sheffield folk justly honor his memory, but little is now generally known of Huntsman beyond the fact that his efforts to keep his process secret failed, and competitors by dishonorable methods prevented him from profiting to any extent by his invention. Cementation steel, made before and to some extent since Huntsman's time, may be disregarded in following the stages of important development in steel-making. Huntsman virtually made Sheffield known to the outside world through the fame of his own works and those of his imitators there. For more than a century the crucible was the principal unit

R. A. BULL

employed in steel-making. It is today and will probably remain for many years a factor of some importance in the manufacture of small steel castings, and by reason of these facts deserves the introductory place in any general description of the founding of our strongest metal.

As the development of crucible practice has involved very few departures from the standards adopted in earlier days, and as the process of making castings by this method is simple in the extreme, only a brief description of this branch of the industry is necessary.

The crucible generally used today in the land of its birth is made of clay, as it was originally, and after burning, is seasoned for many weeks by after-drying. The clay crucible is generally of such proportions as to contain 50 pounds of metal. The crucible commonly used in America is made of a mixture containing about 50 per cent graphite and has a capacity of 90 to 100 pounds. Each crucible is charged with wrought scrap, ferro-silicon, ferro-manganese and any other alloys whose elements are desired to enter into the composition of the finished product. Frequently some steel scrap is used, and occasionally pig iron. To provide additional carbon desired, charcoal is commonly deposited on top of the metal charge, and the lid placed on the pot. The furnace in which the melting takes place may be fired with coke, anthracite coal, gas, or oil. In England coke is still used extensively. In America gas and oil furnaces are generally found in the larger shops. The pots may be arranged in groups from 2 to 30 per furnace.

Crucible practice is a melting one, pure and simple, and merely amalgamates the materials in the pot without refining them. Because the crucible is closed and its contents are not therefore exposed to the flame, there can be no contamination from the fuel. Excepting the small amount of air which was confined in the pot when its cover was applied, there is no opportunity for oxidation, consequently the metal cannot absorb any injurious oxides. This explains the good quality of crucible steel, when proper materials are used for the charge, and the latter is skilfully melted.

A charge is melted, given time to become quiet or "killed", and poured either directly into a mold, or into a ladle in about four hours. This long period, resulting in a relatively high fuel cost, is due to the fact that the crucible—either clay or graphite—is a poor heat conductor. The clay pot lasts from two to three heats. Its fragility restricts its size. The graphite pot lasts from five to six heats, and usually has its bottom sawed off after the pot proper is no longer fit for service, to serve as a cover for another pot. In making low-carbon crucible steel the clay crucible is usually preferred because a graphite pot is inclined to part with some of its own carbon and transmit it to the molten metal. This sometimes occurs even when the graphite crucible is clay-lined, when the lining becomes scored by the boiling of the steel. A small percentage of silicon is usually absorbed by the steel from either the graphite or the clay crucible.

Usually the crucible is drawn vertically from the furnace by a "pot-puller", with tongs, who receives instructions from the melter. The later workman governs the operations by periodic observation of the contents of the crucible. In one type of furnace the pots are removed from the side of the furnace through a specially designed door. The cover being removed, the slag (principally coming from that present in the wrought scrap) is swabbed off the surface of the metal, which is then ready to pour. There are in use ingeniously designed crucibles which drain the contents from the bottom, and so prevent surface impurities from entering the mold.

The molds in a crucible foundry require only moderate ramming and little attention to secure

confinement, since there is very little pressure exerted on them by the small pouring medium. Bench molding is general. For castings of larger size than the capacity of a single crucible, a ladle of proper proportions to take the contents of simultaneously melted pots is employed. Frequently a crucible shop may be found where there are no cranes of any description, all lifting being done by man-power. A tumbling barrel, an emery stand, and a half-dozen chippers may represent the facilities for finishing the product.

Despite the small scale upon which a crucible steel foundry can be seen to be operated, and in the face of the high cost per ton for labor, crucible renewals and fuel (of which in the case of anthracite coal, 8,000 pounds per ton of steel is reported as being required) there will probably be many years before the practice is entirely discontinued in the manufacture of small steel castings. The quality of crucible steel produced from stock judiciously selected and melted is purer than that made by any other process but that evolved by the application of electricity. In fact, there still remain crucible steel advocates who champion the product of the crucible, day in and day out, as superior to average steel made in the electric furnace. This exceptional purity is not required for castings intended for ordinary commercial use, but for small automobile parts and for other special purposes where minimum size is a desideratum and maximum stress is to be applied. The low installation cost and the simplicity of operations naturally appeal to the investor of small means who is so situated as to supply a local market for small castings where price per pound is not so much the basis of purchase as are prompt delivery and superior quality. For these reasons we may almost predict that the crucible steel foundry, like the poor, will be with us always.

The Converter

In 1856 Henry Bessemer, of England, made his name renowned the world over, for all time, by originating the converter for transforming iron to steel. His genius and resultant discovery may, even in this day of the maligned Bessemer rail, be said to entitle this scientist to first place among the many brilliant men who have effectively applied their energies to the production of steel. Up to the time when Bessemer announced his discovery before the British Association steel rarely sold for less than $250 per ton. While the principal application of the Bessemer converter has been in mill practice, its origin was brought about through Bessemer's discovery that the cast iron guns used in the Crimean war were not strong enough for the improved projectiles he had himself invented. The crucible offered serious obstacles to the casting of heavy pieces of steel. Bessemer with characteristic adaptability turned his attention to metallurgy, and the creation of his inventive mind testifies today to his success, after expending $100,000 in experiments. Like Huntsman, he erected works in Sheffield, but unlike that pioneer, Sir Henry Bessemer amassed the great wealth of $5,000,000 in royalties before his patents expired.

It has been observed that the converter owed its origin chiefly to the need for a more suitable and economical unit for the manufacture of large steel castings. But, because of the tonnage involved, it developed that its application was of principal importance in making steel to be rolled, and it was 16 years after Daniel Adamson experimented with lateral blowing through multiple tuyeres in 1864, that its construction began to assume those modifications which made it favored for foundry work as compared with the open-hearth furnace, which meanwhile had been perfected. The essential principle of the converting vessel is the elimination of carbon in iron through oxidation, by subjecting the melted metal to a mechanical blast of air, which also produces great heat by the oxidation, through openings called tuyeres, and then recarburizing as desired by adding carefully selected stock. The experiments made by Adamson preceded activities on the part of other metallurgists, including Clapp, Griffiths, Withero, Walrand, Legenisel, Robert, Hadfield, Tropenas, Stoughton and Stock, who have applied during the last two decades various novel methods of construction and manipulation.

The converter for foundry use is ordinarily of two tons capacity, though smaller units of 1,000 pounds capacity have been operated and larger converters up to five tons capacity are

R. A. Bull

R. A. Bull was born at New Albany, Ind., in 1874. He acquired his higher education at Butler College and at St. Louis University, receiving degrees of A. B. and A. M., respectively.

Mr. Bull's foundry experience followed five years' service as inspector for Robert W. Hunt & Co., and has covered fourteen years in the following positions: Chief inspector and foreman of pipe runs, U. S. Cast Iron Pipe & Foundry Co., Bessemer, Ala.; chief inspector, Shickle Harrison & Howard Iron Co., East St. Louis, Ill; general foreman, Leighton & Howard Steel Co., East St. Louis; assistant to vice president and general manager, Leighton & Howard Steel Co., St. Louis; district inspector for the East St. Louis and Granite City plants of the American Steel Foundries; chief clerk to second vice president, and later chief clerk to general sales agent, American Steel Foundries, St. Louis; manager order department with the same company, New York City; assistant works manager, general superintendent and manager of production, Commonwealth Steel Co., Granite City, Ill., where he now holds the latter position.

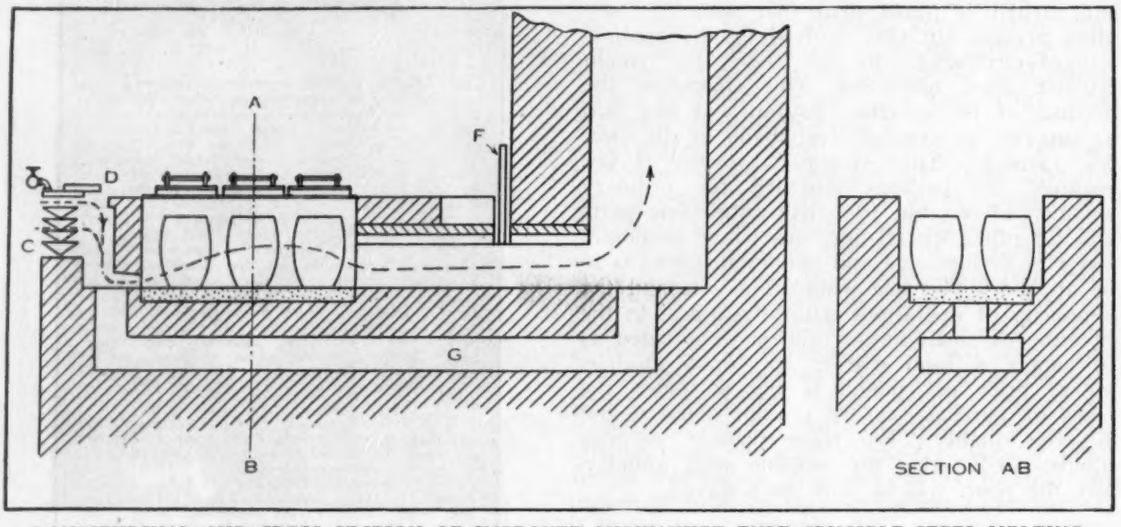
Mr. Bull is senior vice president of the American Foundrymen's Association; is a past president of the St. Louis Foundrymen's Club; is on the executive board of the St. Louis section, American Institute of Mining Engineers. He is a member of the British Iron and Steel Institute, the American Society for Testing Materials, and the American Institute of Metals. He has contributed periodically to the technical press.

occasionally installed. The vessel somewhat resembles a pear in shape, and is swung on trunnions (absent on Bessemer's experimental stationary furnace), which enable it to assume the different positions for the various operations. When conversion is taking place, the small end is upward and a brilliant flame flows from the mouth, in which this end terminates. This mouth is sufficiently large to admit the charge of metal and alloys. The shell of plate steel is lined with refractory material, and in acid converter practice, to which because of well-nigh universal adoption in the foundry we might confine our description, the lining consists either of mica-schist blocks, of siliceous composition, silica shapes designed for the purpose, ganister rock, or silica sand bonded with clay. Particular care must be taken in lining the converter, especially near the tuyeres which, in foundry types, are almost invariably on the side, at or slightly above the metal line when the vessel is in a vertical position. The blast in the side-blown converter, which never exceeds five pounds per square inch in pressure, rapidly cuts away the lining near the tuyeres and this necessitates patching, usually after blowing 20 to 30 heats. The upper portion of the lining frequently lasts for 200 heats. Messrs. Tropenas, Stoughton and others have designed converters whose lower portions are removable to permit quick repairing. With cold air passing through the recently heated vessel, not much time need be lost before workmen can do the relining necessary.

The tuyeres vary in diameter, number, and position according to the ideas of the converter builders. In the preferred foundry type, they pierce the side plates, and are so designed that they make the blast impinge on the bath. In the bottom-blown converter, the blast of about 30 pounds pressure attacks the bath through tuyeres penetrating the bottom. The blast in all cases is delivered to the vessel through one of the trunnions which is hollow, thus enabling the pressure to be applied with the converter in any position.

There is one type of converter recently devised by Stock, which employs no cupola as an auxiliary melting unit. In this converter the cold charge is melted by an oil flame, with the vessel in a position approaching the horizontal, after which conversion takes place in the usual manner.

Except for one type of foundry converter, the iron is charged in a molten condition, the ordinary cupola being employed for melting. It is stated that 500 pounds of coke in the cupola per ton of steel delivered from the converter is a good average for fuel consumption. The converter, after being heated by oil burners or a coke fire, is swung to almost a horizontal position, and the ladle of iron from the cupola is poured into the upwardly deflected mouth. The converter is then righted and the blast from a positive-pressure blower turned into the piping leading to the tuyeres. The melter takes his position on a raised platform called a "pulpit", and regulates the blast pressure and the introduction of ferro-silicon, ferro-manganese and other alloys, as well as the addition of more melted iron, which is sometimes required, by observing, through blue glasses, the characteristics of the flame from the mouth. Sometimes the blast is turned off for the interval required for an examination of the bath. The carbon oxidizes very rapidly and is frequently reduced from 3 per cent to 0.3 per cent in 20 minutes. When the nature of the flame or the quiet appearance of the bath indicates the desired carbon-content, the blast is shut off, the additions are introduced, given time to react, and the converter delivers its burden to the ladle, which may be designed to pour from the lip or from the bottom.



LONGITUDINAL AND CROSS SECTION OF IMPROVED MILWAUKEE TYPE CRUCIBLE STEEL MELTING FURNACE

There is in the acid-lined converter no decrease of phosphorus or sulphur, and in this respect there is a similarity to crucible conversion. But while the carbon is usually added to the metal charge in the crucible, it is *removed* from the metal in the converter, as are other elements subject to oxidation at the existing temperature. This temperature is very high because of the chemical reaction taking place. Consequently, proper additions of silicon, manganese and carbon must be resorted to, for obtaining the desired percentages of these elements in the finished castings. The facility with which chrome, tungsten, nickel, manganese and other metals may be added to the bath, together with the relatively small capacity of the average foundry converter make it especially fitted for the manufacture of steel castings of special composition in small lots, which would not permit molding sufficient weight for the capacity of an open-hearth furnace of economical proportions.

DRAWING POTS FROM A CRUCIBLE FURNACE

Manganese steel can be made by any of the existing methods of steel-making, but is very rarely produced from any other unit than the converter. Hence we will digress for mention of a few pertinent facts. This alloy which was originated (also at Sheffield) by Sir Robert Hadfield in 1886, possesses most peculiar qualities and its manufacture, which is steadily increasing, merits detailed description not possible to embody in a brief general treatise. It generally contains from 10 to 14 per cent manganese and has the extraordinary property of great toughness combined with excessive hardness upon cold water quenching subsequent to heating to white-hotness—a treatment which makes ordinary steel extremely brittle. This hardness is at times sufficient to prevent machining with high-speed tools, and grinding machinery and the flame from a gas torch is employed with much success in removing surplus stock, heavy risers, etc. The resistance of manganese steel to the electric current is another of its peculiarities, being found to be 30 times that of copper, and eight times that of wrought iron. However, the eminent discoverer of this important alloy demonstrated in 1904 that it can be made magnetic by special treatment. The effect of manganese in steel is anything but constant, since from 2 to 4 per cent renders steel so brittle that it may be pulverized with a hand-hammer. As the proportion exceeds 16 per cent, there is a decided return to fragility.

In Europe the basic Bessemer converter has been used in many localities, where the lining generally consists of burned dolomite (a mixture of calcium and magnesium carbonates) bonded with tar. With such a basic lining it is easy to remove phosphorus and to some extent sulphur from the metal by employing a slag formed from melted lime-rock. The use of lime for this purpose was predicted by Dr. Collyer the same year that Bessemer announced his invention, through observation that the phosphorus-content was not affected in producing converter steel. But it was not till P. C. Gilchrist, S. G. Thomas and E. P. Martin seriously turned their attention to this problem in 1876 that the use of lime as a splendid dephosphorizer, and fairly good de-sulphurizer was definitely ascertained. Meanwhile converter shops had been making good steel by

using iron readily available in which these objectionable metalloids existed in very small percentages. The utility of lime in refining was a tremendous factor in the development of steel-making, and was applied with the highest success and greatest facility to open-hearth furnace operation.

It is frequently asked why the basic lining is not commonly used in American converter practice. The melting loss, as the loss by oxidation is called, represented by cupola melting and converter oxidation, is generally conceded to be about 18 per cent in said practice. This is one of the principal factors in the high cost of converter steel. By prolonging the oxidation to materially reduce with lime the percentages of phosphorus and sulphur, the melting loss is, of course, increased. It follows that the amount of repairing to the lining, and the total expense of the entire operation per heat are magnified because of the longer time required for refining. But there are other reasons against a basic lining with an active limey slag in American practice. It was found that there must be a moderately low silicon-content in high-phosphorus iron, to avoid the use of more lime than is practicable to charge in the converter. Silicon is an acid element and in such proportion as it may be present does it neutralize the effect of lime, which is a base. High-phosphorus irons smelted in this country customarily carry more than 1.5 per cent silicon, and it is considered best to use in acid converter practice iron running from 0.5 to 1.5 per cent in this element. The composition of the pig iron produced in America not being adapted to treatment with lime in the converter, a siliceous lining can best be employed. It will thus be seen that a melting medium is termed acid or basic, according to the nature of its lining.

In the foundry, converter steel is sometimes poured from the lip of the ladle, and sometimes from the bottom, as is the invariable custom in open-hearth plants. Bottom-pouring, of which mention will be made later, is preferable for high-grade work, as the metal teemed from the lower part of the ladle is, of course, freer from those impurities that float on the surface, which are not always skimmed back from the overflow with success. Naturally, too, the metal from the bottom is hotter. Because of the excessive temperature, great care must be taken in placement and judicious selection of nozzles and stoppers, to avoid loss of metal by imperfect closures. The molds, into which converter steel is teemed, need be only moderately rammed, as the ladles are not deep enough to cause much pressure on the stream, even when flowing from the bottom. In manganese steel shops, because of the severe cutting action of the metal on the surface or facing of the mold, special precautions must be taken with the sand mixtures.

Converter steel finds its particular field in the foundry, where manganese steel or other special alloy steels are produced, where castings of very thin sections are made, and where furnace operation cannot be continuous. The high temperature of the metal (sometimes 3,400 degrees Fahr.) renders it extremely fluid, and permits the filling of narrow mold-cavities without the freezing of the metal, and consequent "cold-shots". For sections averaging less than seven-sixteenths inch it is preferable to steel made in the open-hearth furnace. The writer has seen castings of wafer-like sections weighing one and one-seventh ounces that have been successfully made in a converter shop.

The installation of equipment to make converter steel castings entails a small expenditure as compared with the cost of an open-hearth plant. Not less than two converters should be provided so that repairs can be made without suspending operations, but neither these, nor cupola nor blowers are expensive and it is claimed that for $6,000 a complete equipment for this department of a foundry may be procured. This factor sometimes induces an ambitious foundryman to install converter equipment for making miscellaneous steel castings, most of which are likely to be of moderately heavy section. He finds, to his sorrow, that a neighboring open-hearth foundry can sell at a fair profit castings of similar nature cheaper than he can make them, and discovers a new application to the old saw, "Every man to his trade", viz.: Every furnace to its particular class of work.

(To Be Continued)

New I-Beam Sections

The Illinois Steel Co., Chicago, has designed and is rolling a new series of I-beam sections, which are illustrated and described in a booklet entitled "Special Light Structural Beams". The company is now prepared to offer these beams to the trade and can make deliveries with the same facility as in the case of beams of standard section.

The new beams show a slight variation from the American standard sections in the matter of depth. A 21-inch beam is introduced into the series, which makes the depth variation somewhat more uniform. The statement is made that, as these latter sections are thoroughly practical and readily available, it will be found that by their use great economy in design can be procured, and in consequence the employment of fireproof construction can be considerably extended.

"The Manufacture of Steel Castings" is the title of an interesting copyrighted pamphlet recently issued by the Tropenas Converter Co., 50 Church street, New York. In this booklet the manufacture of steel castings is covered in a thorough and comprehensive manner, commencing with a definition of steel and concluding with pointers on molding practice. A large number of illustrations are shown.

New Swing Grinder

A swing frame grinding machine provided with a protection hood and an arrangement for connecting it with a dust exhaust system, recently has been placed on the market by the Pittsburgh Emery Wheel Co., Pittsburgh, Pa. The machine is provided with roller and ball bearings throughout, which make it easy to operate and tend to increase its life. It is designed to conform in detail with the requirements of the department of labor and industry of the state of Pennsylvania, and is therefore particularly suitable for installation in communities where rigid dust exhaust laws are enforced.

The principal features of the machine are shown in the accompanying illustration. The frame consists of 4-inch horizontal and vertical pipes so connected through special castings and swivel joints that the grinding wheel may be moved in any direction. The relative positions of the motor and wheel are fixed, and there is, therefore, no tendency to twist the belt or change its tension.

The dust is exhausted from the hood through the horizontal pipe which terminated in a flexible hose that may be attached to a permanent dust exhaust system. If the main dust exhaust pipes are overhead, connection may be made with the upper end of the vertical pipe which in turn may be attached to the horizontal pipe by means of a flexible hose. The weight of the head of the machine is balanced by a suitable counterweight.

CARRIAGE AND DIE END OF AN UNUSUAL CHAIN DRAW BENCH

Extra Heavy Draw Bench

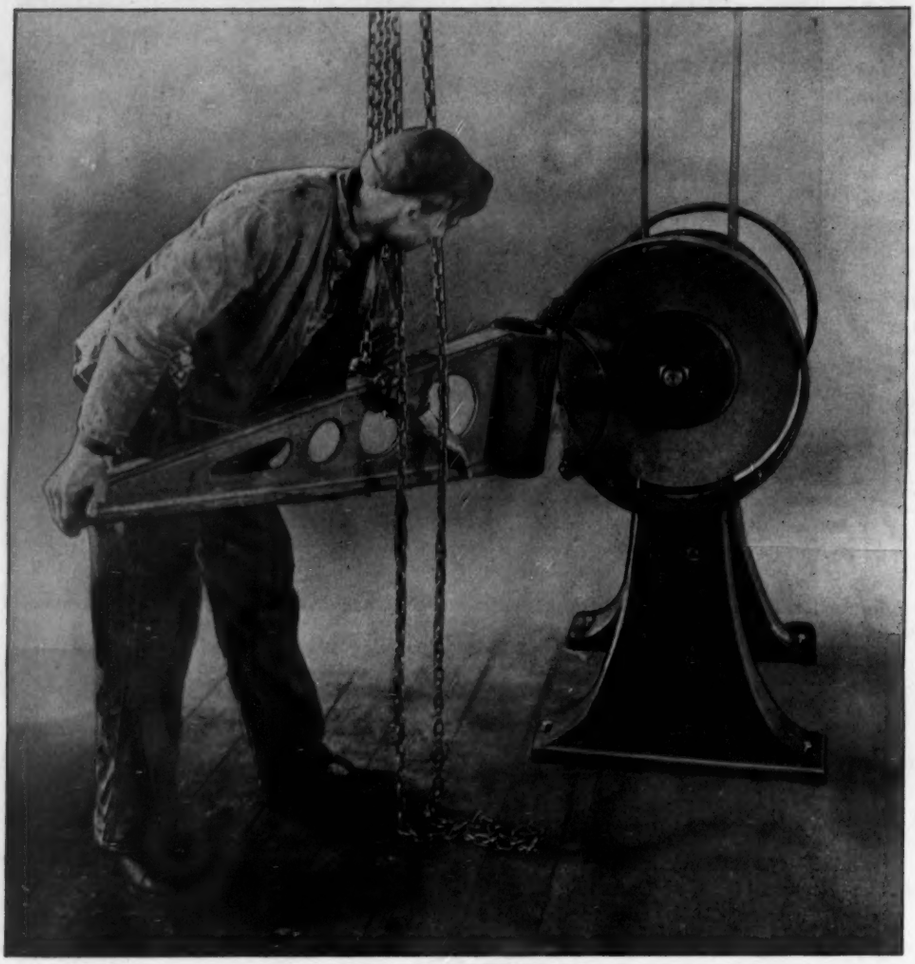
The accompanying illustration shows a draw bench for drawing rounds from 1 to 6 inches in diameter and irregular shapes of the same area. The bench was built by the Brightman Mfg. Co., Columbus, and weighs 40 tons. It is said to be one of the largest chain draw benches that has ever been built and is designed to take care of alloy steels of all kinds as well as soft steel. It is provided with a pushing attachment for pushing bars through the die. The two main driving gears weigh 12,000 pounds and the vanadium steel chain weighs 8,000 pounds. The bench is driven by a 100-horsepower direct connected motor.

SWING FRAME GRINDER WITH DUST EXHAUST CONNECTION

Prize Awarded to Niles-Bement-Pond

Niles-Bement-Pond Co., of New York, has been awarded a prize of $20,000 for the design for a complete shop equipment for National Railways of Chile. About a year ago Chile advertised all over the world for the submission of plans for a railway repair plant for its system. They offered $30,000 in prizes, the first prize being $20,000 and the second $10,000. The choice was to be made last December. When the time came for the selection of the best plans, the government was not satisfied with the specifications sent in, although they had been offered by eight different companies in England, Germany, Belgium, Portugal, Chile and the United States. The date of the selection was, therefore, postponed until May 1, 1914.

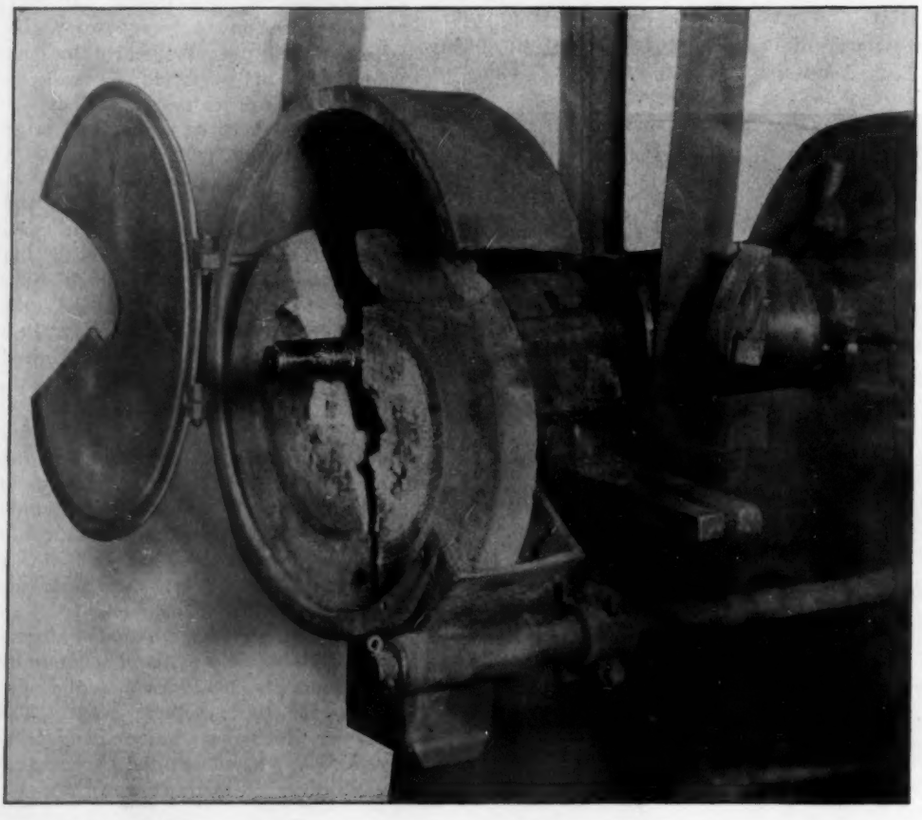
Without communicating in any way with the Chilean government, the Niles-Bement-Pond Co. put two men at work to devise a complete machine shop for every emergency that could arise on a railroad of the size of the Chilean system. When their task was finished, the company sent to Valparaiso a large volume bound in Morocco and elaborately lettered, containing approximately 100 drawings and diagrams for the complete plant. The volume, which cost the company nearly $5,000, was submitted by a representative in Chile. It won the prize.



Snagging Castings

IN HIS lectures on safety as applied to grinding wheels, R. G. Williams, safety engineer of the Norton Co., Worcester, Mass., to whom we are indebted for the photographs reproduced on these pages, calls special attention to the dangers involved in snagging large castings on fast running wheels. Serious accidents have happened where heavy castings are ground while suspended by means of a chain hoist, which permits heavy blows being struck against the wheel. The wheel should be protected by a strong steel hood, as shown in the illustration at the left, even though the workman usually stands out of the range of flying particles.

* * *



How Wheels Break

THE illustration at the left shows a closed steel hood used by the International Harvester Co. Its effectiveness in preventing accidents is clearly illustrated. The wheel split through the middle, after which a large piece broke off the rim. Had the wheel been supplied only with safety collars, the latter piece could easily have done serious damage. Only a strong hood will eliminate the dangers that arise from small chunks breaking off the rim of a grinding wheel.

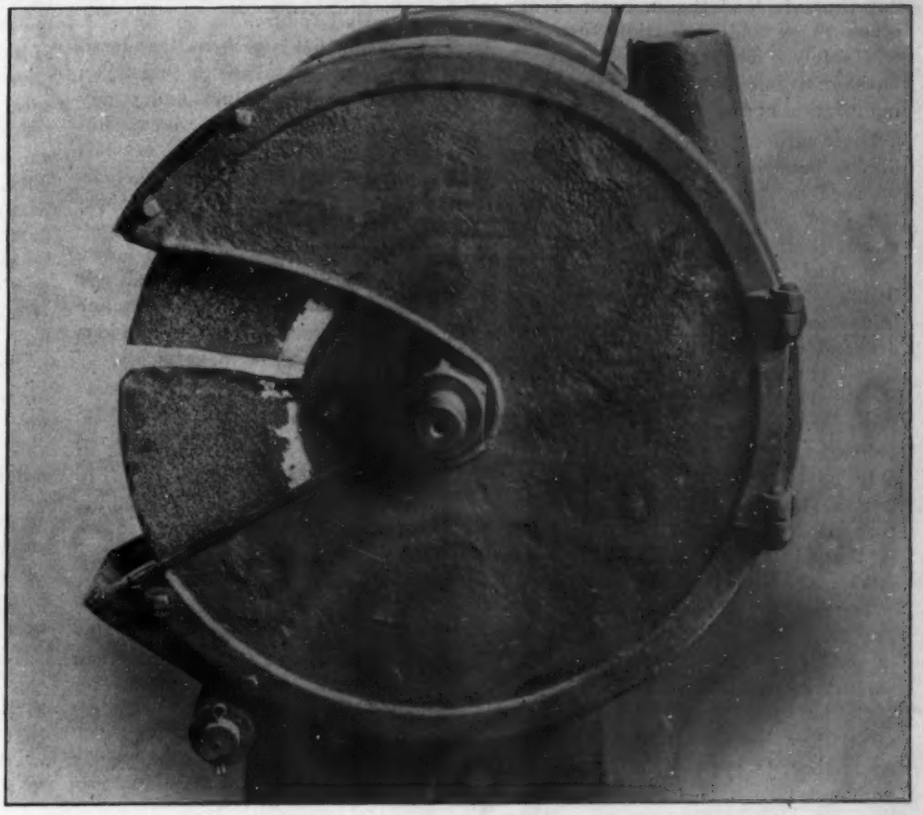
Properly Guarded

GRINDING wheel operators should wear goggles and leather gloves. The particles cut off by the wheel are comparatively small and a heavy type of goggle is unnecessary. The goggles should have side guards of wire or leather to prevent particles entering the eye from the side. As a further protection against sparks, the wheel shown in the illustration at the right is provided with a leather spark brush. It consists simply of a piece of leather attached to the top end of the protection hood and extending down over the face of the wheel, a slot being cut in the leather the approximate width of the grinding wheel.

* * *

A Steel Hood

A PROPER hood affords complete protection. Safety collars, or flanges, cannot offer complete protection. Where users of grinding wheels have reported unsatisfactory results from protection hoods, they have usually been due to the employment of hoods that were not heavy enough, or were made of weak materials. Hoods should be strongly and substantially constructed, so that when the wheel breaks, as shown in the illustration to the right, no harm will be done



Safety in Handling Heavy Loads

Heavy Weights Are Continually Handled in Iron and Steel Plants and Proper Equipment is a Necessity

BY EDWARD GODFREY

ACCIDENTS frequently happen where heavy loads are being lifted. Many are due to weak parts or details of equipment used in handling loads, and they could be avoided by proper care in the selection of these parts or a proper design of the details. Very frequently but little thought or care is given to these matters, the parts being selected by rule-of-thumb methods and the details being designed in the same manner.

If permanent structures received no greater care in their design than many of the tools for handling great loads, it would be hazardous to take a ride over a bridge in a train. Why should not the same degree of safety be demanded where a few lives are jeopardized as where a large number of lives are concerned?

Some time ago the writer was called upon to pass upon the safety of a piece of equipment that was purchased as a 12-ton derrick. The first thing he found was a 6-ton hook. Other parts, while not so weak, were far from figuring up to their requirements. It is not difficult to figure out the safe load that a hook of any given shape and dimensions can sustain safely. The critical section is a horizontal one just beside the opening of the hook.

High carbon steel is often used for hooks because a smaller hook may be used in the stronger material. If the fiber stress never exceeded the elastic limit of the material, high carbon steel would be entirely safe for hooks. The load on hooks, however, is apt to be quite variable and to be dropped some distance in the handling. If the fiber stress equals the elastic limit, a number of applications would break the hooks. In softer steels the hook would probably be bent and thus give warning, but in high carbon steel it would snap off short without warning. This is the danger of using hard, brittle steels where the loads are apt to overstrain the steel. Soft steels are not free, however, from this danger of sudden and sharp breaks when subject to repeated excessive stress.

Hooks are sometimes annealed, after they have been in service for some time, to restore the metal. The common notion is that steel crystallizes in service and that annealing restores the structure that is injured by this crystallization. This is one of the half-truths that give rise to much misapprehension. Steel can be made to give service indefinitely without any deterioration; furthermore, it is impossible to change the crystalline structure of cold steel.

The condition under which steel will remain permanently uninjured is that the fiber stress never equals or exceeds the elastic limit. Repeated application of fiber stresses near to or in excess of the elastic limit will rupture the steel eventually. Unfortunately equipment for handling loads is very often made of such size that the loads handled, when shock is considered, are sufficient to stress the steel close to the elastic limit. The result is that such parts as hooks and chain are apt to fail in service, and every precaution is needed to avoid this.

Steel that has been badly treated by applying strains close to the elastic limit is rendered brittle. Annealing restores to some extent at least, the toughness of the steel and would often forestall failure.

The idea that steel is rendered crystalline by shock is a mistaken one. Steel is crystalline under any circumstance. If it is broken suddenly, it will show up the crystals more clearly in the fracture, whereas, if the same piece were pulled apart slowly in a testing machine the crystals would be drawn out like fibers. Accidental breaks are almost always sudden ones, they show crystalline fractures, hence the common idea that steel crystallizes in service.

Rings Should be Ample in Size

Rings are necessary on the ends of chains to throw over hooks and to pass the chain through in forming slings. Closed rings can be of much smaller diameter iron than open rings, but round rings must be of larger iron than the links of chain, which are usually of oval shape. Also the rings being of larger diameter than the links of the chain require further increase in the size of the iron for equal safety.

A ring of ½-inch diameter steel, 3 inches in diameter, is good for 260 pounds; ¾-inch steel in a 4-inch ring is good for 650 pounds; 1-inch steel in a 6-inch ring is good for 1,030 pounds; 1¼-inch steel in a 7-inch ring is good for 1,720 pounds; 1½-inch steel in an 8-inch ring is good for 2,600 pounds. These values are very low, for quiescent loads, they could be twice this amount or more.

Oval links are stronger than round ones because the bending moment is less. Without going into the exact theory giving the bending moment on an oval ring it is close enough to consider that the strength of an oval ring is equal to that of a round ring of a diameter equal to the short diameter of the oval ring. The writer knows of no standard giving the safe strength usually attributed to rings, so that he cannot make any definite statement as to the degree of safety usually employed. He has seen rings break in service, which is a good sign that they were overtaxed in that service.

The safe loads which chains may carry are usually taken as one-third of the ultimate strength of the chain under test. The proof strain is usually one-half of the ultimate strength of the chain. This load is usually applied to the chain after its manufacture. It is by no means a safe load for the chain, though it is sometimes considered such. Applied to the chain once, it elongates the links somewhat, and its application will usually detect any badly welded links. But repeated application of this load would in time break the chain, as it strains the fibers beyond the elastic limit.

When chain is strained to the point of rupture in a testing machine, the links elongate and become straight and parallel along the sides. The failure is then one of direct tension on the steel, and the bending strains of the original link are not present. For this reason the ultimate strength of steel or wrought iron chain is not in itself a proper criterion of its safe load.

There is another way that chain can be broken. This is by the process of repeated application of a load that will strain the extreme fibers of the metal beyond the elastic limit. The links need not be appreciably

distorted by this, but the metal is gradually made brittle and will eventually fail at a load equal to or less than that which it has repeatedly carried. The break will be short, showing a crystalline fracture, and the majority of observers will say that the steel was crystallized in service, or was a poor grade of metal, or was burnt. All three answers are wrong. This false interpretation of failures that result from overloading equipment is so common that it has become engineering second nature to incorporate it into practically every report on such failures. Rings and hooks and bends and chains all fall in the same class. Men reason that because the load is carried once, or a number of times, or because the ultimate static load to rupture the thing is three or four times that which it is carrying, it is perfectly safe. When failure takes place they say bad steel or crystallization. There is no more invidious error than this. It has taken hold of the engineering profession, and from the writer's experience in trying to root out sundry other errors he believes it bids fair to abide for many years.

The standard safe loads used on chain in one bridge shop are shown in the following:

Capac., tons	1	2	3	5	6	8	10	11	12	14
Dia., inches	⅜	½	5/8	¾	7/8	1	1⅛	1⅛	1⅛	1¼

This is in agreement with common practice. The loads are about one-third the ultimate strength of the chain. By applying the formula for round rings, we find that for ⅜-inch chain the safe capacity is 350 pounds; ½-inch chain the safe capacity is 620 pounds; ¾-inch chain the safe capacity is 1,400 pounds; 1-inch chain the safe capacity is 2,500 pounds; 1¼-inch chain the safe capacity is 3,900 pounds.

It will be seen that these values are exceedingly low, something like one-seventh of the commonly used safe loads. Even if doubled, that is, if 20,000 pounds be taken as the extreme fiber stress, the values are still very low. There is one allowance that could be made in this theoretic strength of a chain, namely, a reduction in the lever arm because of the fact that links fit together to some extent and do not bear on a point. Making all such allowances, however, it is plainly seen that the commonly used safe loads on chain are such as to strain the fibers to the elastic limit. This is why chains get brittle and break. This is why they need frequent annealing. This is why so many coroners' juries have seriously deliberated over a little piece of "defective", "burnt", "crystallized" steel. Stud link chain is stronger than ordinary link chain because the studs prevent the links from flattening and diminish the bending moment. The advantage of stud link chain over ordinary chain is much more than that shown in ultimate tests because of the diminished bending moment, something that does not show up in ultimate test loads, but does show up in a large number of applications of a supposed safe load.

Load Should Be Properly Hitched

Chain that is safe for lifting a certain load may be overstressed in lifting that load by improper hitching. Chain is usually made either of wrought iron or soft steel that is capable of being welded. Wrought iron chain is better than steel chain of the ordinary quality, because it will stand weather better, and because wrought iron welds are more reliable than steel welds. Also wrought iron links are less apt to break short; they will bend and give warning of approaching failure.

In all the literature connected with the Safety First movement the subject of suitable equipment and tackle for handling heavy loads has been given comparatively little attention. Yet the proper design of hooks, blocks, pulleys, chains, cables, etc., plays no unimportant role in conserving human life and limb. The accompanying paper on this subject, by Edward Godfrey, structural engineer for R. W. Hunt & Co., Pittsburgh, contains some very pertinent suggestions. It was presented originally as the report of the chairman of the structural committee of the Engineers' Society of Western Pennsylvania, and was read Jan. 6, 1914.

There is not much difference in the strength of wrought iron and soft steel chain. The grade of steel used in the manufacture of the latter has an ultimate strength of but little more than 50,000 pounds per square inch, which is about the high limit of wrought iron.

Chains as well as rings and hooks are commonly annealed to restore the toughness of the steel or iron. This annealing usually consists merely in building a fire and throwing the chain into it and heating it red hot and then allowing it to cool.

The toughness of the metal seems to be restored by this process, for chain that is quite brittle can be rendered useful by this annealing. The fact that the chain is brittle and needs to be annealed indicates that it has been subjected to service that strains the fibers close to or above the elastic limit. This common practice of annealing chain, as well as the frequent breaks that occur, are the outcome of the still more common practice of overloading equipment for handling loads.

Hemp and sisal ropes and steel cables are much used in handling loads. As a rule, there is more safety in the use of cables than in chains or hooks. Cables loaded excessively will stretch out appreciably and give evidence of their distress. They will not last long, however, especially with the small sheaves that it is customary to use in hoisting equipment. An advantage is that they seldom break suddenly and the wear or deterioration is plainly visible on the surface in broken wires.

Sisal rope is about three-quarters as strong as manilla. The strength of ropes is quite variable because of the different qualities of material used in their manufacture. The factor of safety should be five or six for a good life of rope.

The proper safe load on a steel cable is governed somewhat by the use to which it is to be put. If it is to sustain a steady pull in a stationary position a factor of safety of three would be sufficient. If it is to be passed continually over small sheaves and subject to varying loads, the factor of safety should be five or six.

It is difficult to make an end hitch on a steel cable that will stand the strain required to break the cable. The way it is frequently done is to bare and broom the ends of the wires, pickle them and then put this prepared end in a conical socket and pour melted zinc around it. It might be reasoned from this that as this is the strongest end detail it is the proper one to use on the cable in practice. This is not the case, however, a better end detail is to loop the cable around a thimble and use several clamps to bolt the free end to the cable itself. This kind of hitch is probably not so good in a testing machine, because at the ultimate load of a cable it is drawn down in diameter and would slip through clamps. At the working load of a cable this would not take place. The socket detail is uncertain. It is impossible to tell whether the wires are held firmly in the metal without pulling the joint apart and destroying it. Also

there may be unequal stress on the several wires as well as some tendency to anneal due to contact with the hot metal. It can be readily seen whether the other end hitch is properly made or not.

Sheaves Should Be Large

As will be more fully pointed out under sheaves, the sheaves and drums for cables should not be too small. Curving the cable to a short radius while under stress is detrimental. The outside wires are thereby overstressed and the life of the cable is shortened. It is particularly bad when the drums or sheaves are close and so located as to bend the cable in different directions, hence it is important in the proper use of cables to avoid such conditions in the design of equipment.

Cables should be lubricated, not only to prevent rust, but to allow the wires to slide on each other so as to diminish the strains due to the bending of the cables. Sometimes a mixture of linseed oil and pine tar is used as a lubricant, sometimes mica axle grease is used.

Cables in service gradually wear out by breaking one after another of the wires. These breaks are on the outside of the cable where they can be seen and counted. If these breaks are generally distributed along the cable, the reduction in the strength of the cable is not great, unless the breaks are quite numerous. S. Diescher, in the Proceedings of the Engineers' Society of Western Pennsylvania, Volume 12, states that when it is found that within the length of the pitch of a strand about 40 per cent of the wires are broken, it is time to discard the cable. There are 114 wires in the ordinary cable. If 46 of these are broken in the length of the cable in which a strand makes a complete whirl, it is time to throw away the cable. This count can readily be made. It should be made at several points along the cable, and the state of the cable should be judged by the worst condition, not by the best or the average.

It is the general rule that the sheaves for ropes and cables should be of a diameter 30 or 40 times that of the cable or ropes. While this rule is observed in stationary sheaves, for elevators, inclines, etc., it is very generally ignored in equipment for handling loads. This is not a very serious matter, however, as it simply means that cables will wear out in a shorter time. Thirty-inch sheaves on a derrick using ¾-inch cable would be very much in the way. The rule can scarcely be adhered to in ordinary equipment.

In the matter of the sizes of pins in sheaves there is room for improvement in common practice. If the ordinary methods of figuring bridge pins were applied to sheave pins, many of them would be found to be very highly overstressed. Many designers figure such pins for shear only. This is a mistake. The bending moment is the governing factor in a pin, and in fact the only one that needs to be considered.

The writer has checked the designs of many derricks and has talked with the designers. There is a general disregard of engineering principles, particularly in the matter of bending moments on pins, exhibited both by the designers and by their work. Pins 1¼ to 2 inches in diameter are the common standards. The extreme fiber stresses calculated in the usual way are often in excess of the ultimate strength of the steel, just like the highway bridge designs of 25 years ago.

When pins are in iron or steel bearings they can be considered as having high bearing pressure, thus shortening the lever arm for bending, but when they are in wood, the high pressure would crush the fibers of the wood. It is important in such cases that the pins be of extra large size, so that they will not bend.

Support for a Long Derrick Boom

In addition to the parts already mentioned, all of which are used in derricks, there are other parts in derricks that need attention from the standpoint of strength of design; the mast, the boom, the guys, the stiff-legs, the goose-necks, the gudgeon pin, etc.

In a guyed derrick the mast must be high enough to allow the boom to pass under the guys. In many stiff-leg derricks the boom is twice as long as the mast. Derricks with masts 30 to 35 feet long and booms 60 to 70 feet long are not uncommon, such derricks need special care on account of the long boom, and the problems entailed thereby. One of these problems is the support of the long and slender boom. Frequently the dead end of the boom line is hitched to the boom about at the middle to support the weight. The writer sees no objection to this so long as the strain is not too great for the weight of the boom. Hog rods with one or two intermediate posts are very useful in reducing the unsupported length of a boom. These should be used where slender booms are employed. It is best to use them on all four sides of the boom.

In designing a long boom, the ordinary column formula is of no use. The straight line formula for columns, while it is excellent for bridge members, fails when attempt is made to use it for slender columns. The Gordon-Rankine formula, with the constant usually given, is unreliable and unsafe when used for slender columns. The Euler formula, when properly interpreted, that is, when it is understood that the formula gives the absolute ultimate load that a column can sustain, is the proper formula for slender columns. The common idea that the Euler load is one that a slender column can hold in equilibrium is totally false and gives rise to misapprehension.

Fiber Stress on Long Boom

A 14 x 14-inch boom supported for its own weight, of a length of 70 feet, will have an ultimate strength of 330 pounds per square inch. For safe load the factor of safety should be at least two. This boom would then be good for 165 pounds per square inch of load, or 32,300 pounds.

It is a remarkable fact that the boom mentioned in the last paragraph, if supported freely in a horizontal position, will have an extreme fiber stress from its own weight of nearly 900 pounds per square inch, and yet it will not fail from this stress. It will, however, be very greatly weakened as a compression member. This boom is one that failed in a derrick in Pittsburgh about eight years ago while lifting a load of 18,000 pounds. The unit stress from this load was 170 pounds per square inch, which is just about the allowed safe load, but the weight of the boom was not supported, and in its inclined position the extreme fiber stress from the weight was 590 pounds per square inch.

The strength of slender compression members under lateral loads is something that has been neglected in engineering literature. The writer will not attempt to go into this at this time except to point out that long booms should be supported so that their weight will not be so large a factor in producing stress.

In *Engineering News*, June 26, 1913, there is an account of a derrick boom that failed while lifting a load of only about one ton. The boom of this derrick was 10 inches wide and its length was 65 feet. The ultimate strength of this boom is 200 pounds per square inch. The boom was supported at the middle by the dead end

(*Continued on page 270b*)

Concentrating at Barton Hill

How An Abandoned Mine Has Been Made Profitable by a Specially Designed Three Part Separation Plant

BY H COMSTOCK*

DURING 1907 the Barton Hill iron mine, belonging to Witherbee, Sherman & Co., Mineville, N. Y., was re-opened after having been abandoned for a period of about 22 years. When previously worked this mine consisted of a deposit of coarsely crystalline magnetic ore in which little or no gangue rock occurred to interfere with the furnace reduction as practiced 20 years ago. This high grade ore having been eventually stripped, the mineral remaining was very low grade, requiring that it be milled to be made commercial. A course of magnetic separation not having been devised at that time, the mine was abandoned.

In 1907 the mine was prospected through a tunnel driven into Barton Hill, alternately through lean ore, pure ore and rock. This tunnel undercut the old skip-ways and passed through the old workings, which today serve as the main haulage-way for delivering the ore to the mill. The ore being mined today consists of a mixture of pure and very lean ore finely disseminated through the gangue rock, which is an exceptionally hard, close-grained feldspathic gneiss. The crude ore delivered to the mill runs about 35 per cent in iron and 0.085 per cent in phosphorus. The concentrates from the mill run 65 per cent in iron and 0.018 per cent in phosphorus, with a very small percentage of fines.

In working out tests previous to erecting the mill, careful treatment was given the ore to determine a process which would give the most satisfactory results in the separation in order to make the ore commercial. It was decided from these tests that a three part separation only would give the desired results; that is, not to make concentrates and clear tailings in one operation as is the practice in the first mills built by the company, but to make concentrates, middlings and tailings. By this method the concentrates would be high grade, the tailings low in iron and the middlings would be reground in rolls and returned to the feed of the mill for reconcentration. This system required graded crushing and close screen sizing, as will be seen in the accompanying description of the separation. Having decided on this scheme, the design of the three mills then in operation was improved upon and the No. 4 mill was built in 1911. This mill has proved one of the most successful mills in operation today on this type of ore.

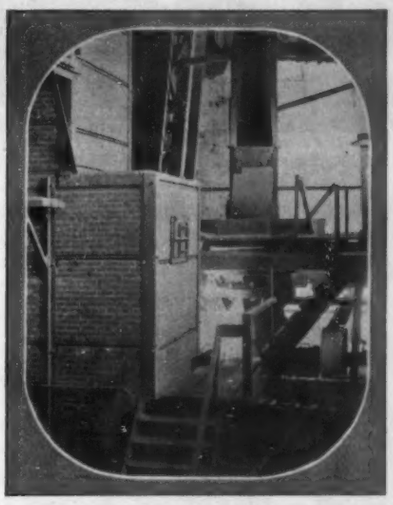


FIG. 1—SECTION OF DRYER

The mill is divided into two departments; a course crushing department and a separating department. If either is idle because of a breakdown, the other still may operate. This is made possible by a 1,000-ton storage bin in the center of the mill into which the crushing department delivers and from which the separating department is fed. The two departments may be operated in unison or independently according to the requirements, and are both under one roof. The dimensions of the crushing department are as follows: Length, 71 feet; breadth, 36 feet, and height, 62 feet from the ground line, not including the elevator pits, which are 30 feet deep. The separating department is 125 feet in length, 66 feet in

*General Superintendent, Witherbee, Sherman & Co., Mineville, N. Y.

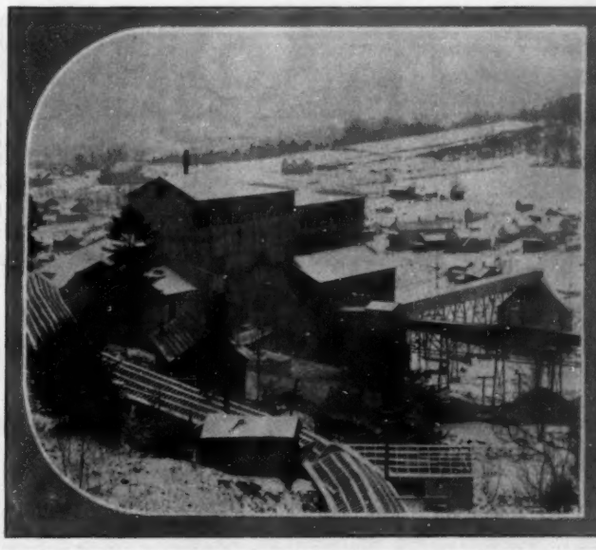


FIG. 2—WITHERBEE-SHERMAN MILL AT BARTON HILL

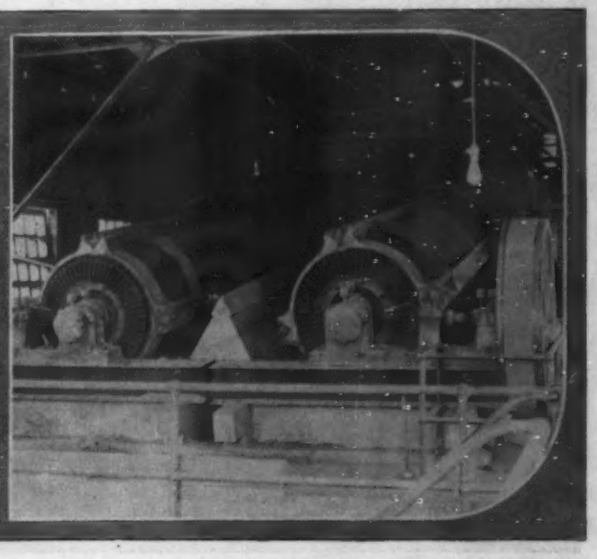


FIG. 3—ROTARY SCREEN IN SEPARATING DEPARTMENT

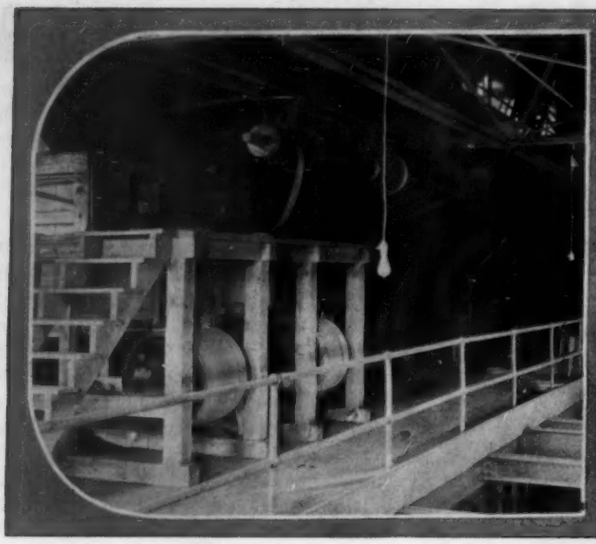


FIG. 4—A PORTION OF THE SEPARATOR FLOOR

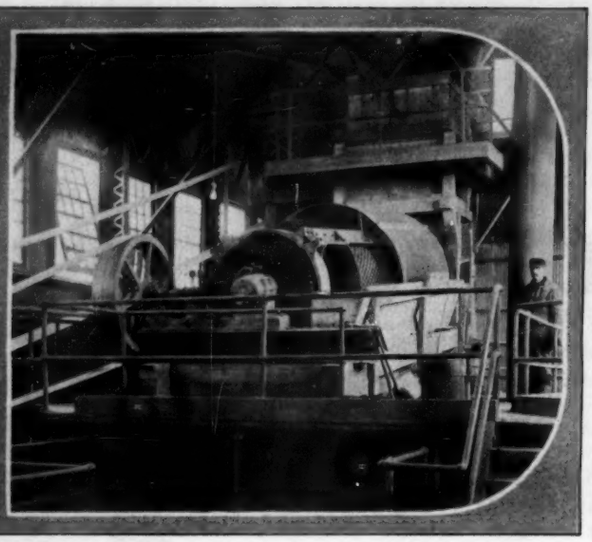


FIG. 5—REVOLVING SCREEN IN CRUSHING DEPARTMENT

breadth and 80 feet to the roof trusses. The mill is a steel structure covered with corrugated iron, well lighted and ventilated, so far as the dry separation will permit. The floors are 2-inch planking by ⅞-inch hard wood matched lumber.

A 200-ton bin at the head end of the mill receives the output of the mine, which is 1,000 tons in two eight-hour shifts. From this bin the ore is drawn off by means of a shaking feeder. It consists of a pan 6 feet by 36 inches by 18 inches, which is suspended from overhead by rocker arms and is given a backward and forward motion by means of an eccentric with a 2-inch throw, which operates at 60 strokes per minute. The feeder throws the ore into a 24 x 36-inch jaw crusher. This crusher, running at a speed of 208 revolutions per minute, handles all the crude ore from the mine, which has a maximum size of 18 inches and is reduced to a maximum size of 4 inches.

From the jaw crusher the ore falls

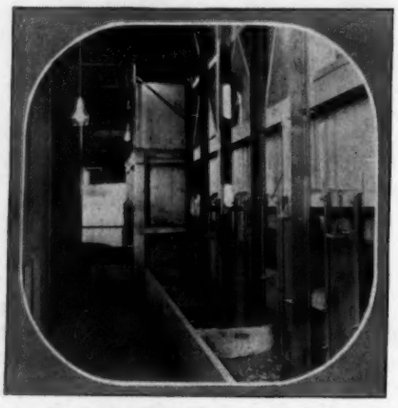


FIG. 6—STORAGE BINS OVER SEPARATORS

through a gravity chute to a feed hopper, which in turn delivers it to a 24-inch bucket elevator. This elevator has an inclination of 68 degrees and is 84 feet long between head and foot pulleys. The buckets used on this elevator are 24 inches wide, 13 inches on the belt and have a 10-inch lip; the buckets are close coupled to an 8-ply 26-inch belt having a speed of 238 feet per minute. This gives the elevator a maximum capacity of 330 tons per hour, or 2,970 tons per shift of nine hours in the mill. The elevator, however, is seldom if ever called upon to convey this amount of material due to the intermittent feed of the mill.

This No. 1 elevator delivers into a feed hopper, which feeds a trommel screen where the first sizing is done. Three sizes are made on this screen: On 2-inch, through 2-inch; and on ¾-inch and through ¾-inch. The dimensions of the screen are as follows: Length, 10 feet; diameter, 4

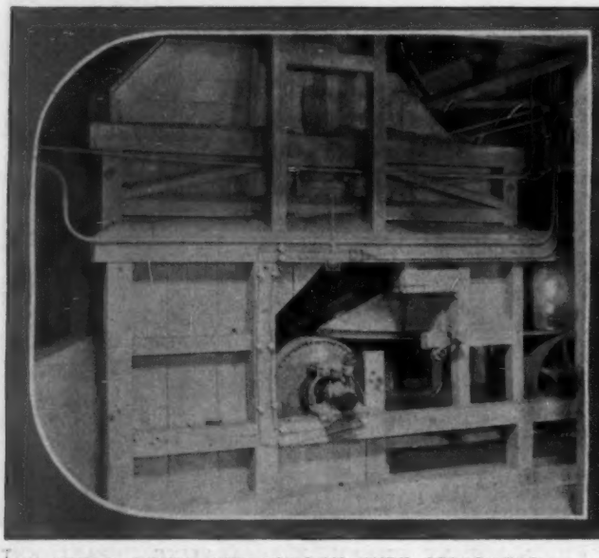


FIG. 7—DRUM AND PULLEY TYPE SEPARATOR

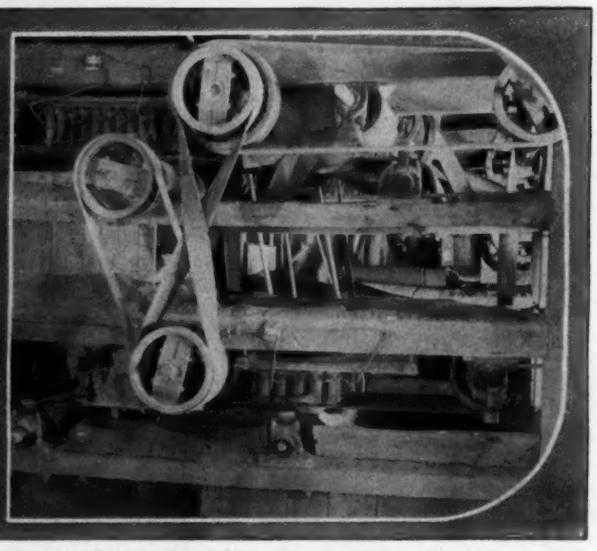


FIG. 8—SERIES TYPE BELT SEPARATOR

feet, and inclination 1⅜ inches per foot. The body of the screen is made up of two 5-foot sections of 3/16-inch plate with 2-inch perforations. The jacket is 7 feet in length and has ¾-

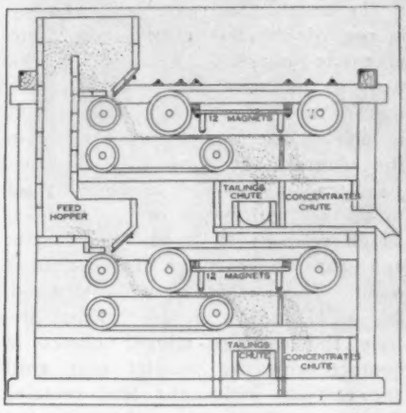


FIG. 9—BELL TYPE PARALLEL SEPARATOR

inch perforations. The fine size falls directly into the dryer; the intermediate size passes in to the separating department, and the coarse size is delivered by means of chutes to two No. 5 gyratory crushers, which reduce the material to a maximum size of 1½ inches. The three sizes meet in No. 2 elevator on which they are delivered to the separating department of the mill, or by means of a by-pass chute to the 1,000-ton storage bin.

Construction of Tower Dryer

The tower dryer is simply a square stack laid up of three courses of red brick and lined with two courses of fire brick, having an inside space of 4 feet 9 inches square by 40 feet 6 inches high. This space serves as the flue

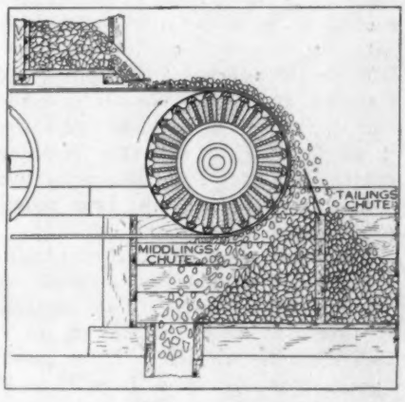


FIG. 11—SECTION OF PULLEY TYPE SEPARATOR

for the fire as well as the drying space for the descending ore. In order that the ore may receive a thorough drying, it must drop slowly through the stack. This is accomplished by placing baffles in the stack. At the top of the stack there is a group of cast iron T-shaped bars with a 4-inch flange and webb. These bars are 4 feet 9 inches long. The T-bars drop into cast iron recesses laid into the brickwork in such a way that there is a 4-inch space between each flange. Seven of these T-bars form one tier and six of these tiers make up one group. Between each tier there is a 5-inch space in the clear. This insures a free passage of the ore through the dryer. The next group below is laid in the same manner but the T-bars have a direction at right angles to those above. This alternate manner of laying is maintained throughout the height of the dryer.

The No. 2 elevator is driven from either the crushing or separating department motors, so that the crushing department may be run without the separating department, the ore being delivered into the storage bin through the by-pass. No. 2 elevator, besides handling the feed of the mine, receives the feed from the bin, and the middlings thrown back from the magnetic separators in the separating department, when that part of the mill is in operation. The No. 2 elevator, like No. 1, is 84 feet centers between the head and foot pulleys, the buckets are 30 inches wide, 13½ inches on the belt and have a 10-inch lip. They are bolted to a 32-inch 10-ply belt. The elevator has a maximum capacity of 400 tons, or 3,600 tons for the nine-hour shift.

When the separating department is in operation, a 20-inch belt conveyor receives the discharge from the No. 2 elevator and conveys it to two 48 x 24-inch trommel screens, one on each side of the mill. These two screens make the following four sizes: Through 2-inch and on ¾-inch, through ¾-inch and on ⅜-inch, through ⅜-inch and on ¼-inch, and through ¼-inch. The first three sizes drop into bins. The last size is delivered by gravity to two Newago screens. These screens make two sizes: through ¼-inch and on six mesh, and through 6 mesh. This material also is delivered to bins. These bins are situated directly over the magnetic separators.

Three Part Separation

A three part separation consisting of heads, middlings and tails is made on each one of these sizes, except the last or finest size. Only heads and tails are made on this material. The first three sizes are treated by a combination of the drum type and the pulley type magnetic separators. The upper or drum machine removes the heads and the lower, or pulley machine, makes middlings and tails. A three-part separation is made on the next size by series type belt separators. The top machine removes the

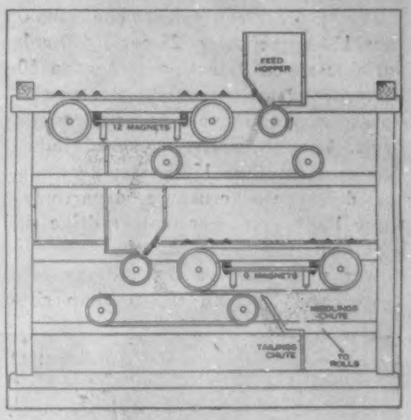


FIG. 10—BELL TYPE SERIES SEPARATOR

rich material and the bottom machine makes middlings and tails.

The middlings from each separation are delivered by means of chutes and hoppers to eight sets of rolls placed on the ground floor. After passing the rolls, the middlings drop directly onto a 20-inch belt conveyor and are conveyed to No. 2 elevator. The middlings are thus reground and thrown back into the feed of the mill for reconcentration.

Series and Parallel Separators

The fine size is treated on parallel type belt machines. The action of the various types of magnetic separators may be clearly seen in the accompanying sketches. The series and parallel machines are similar in con-

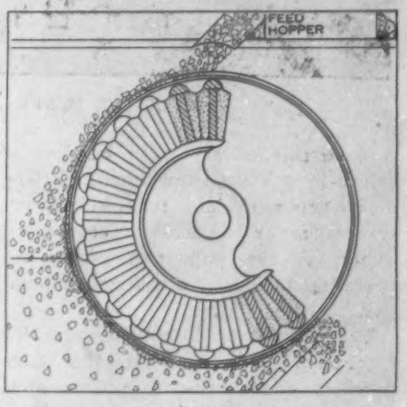


FIG. 12—CENTER SECTION THROUGH DRUM MACHINE

struction, but the capacity of the parallel is double that of the series machine.

The concentrates are conveyed 300 feet to a railroad spur and are dis-

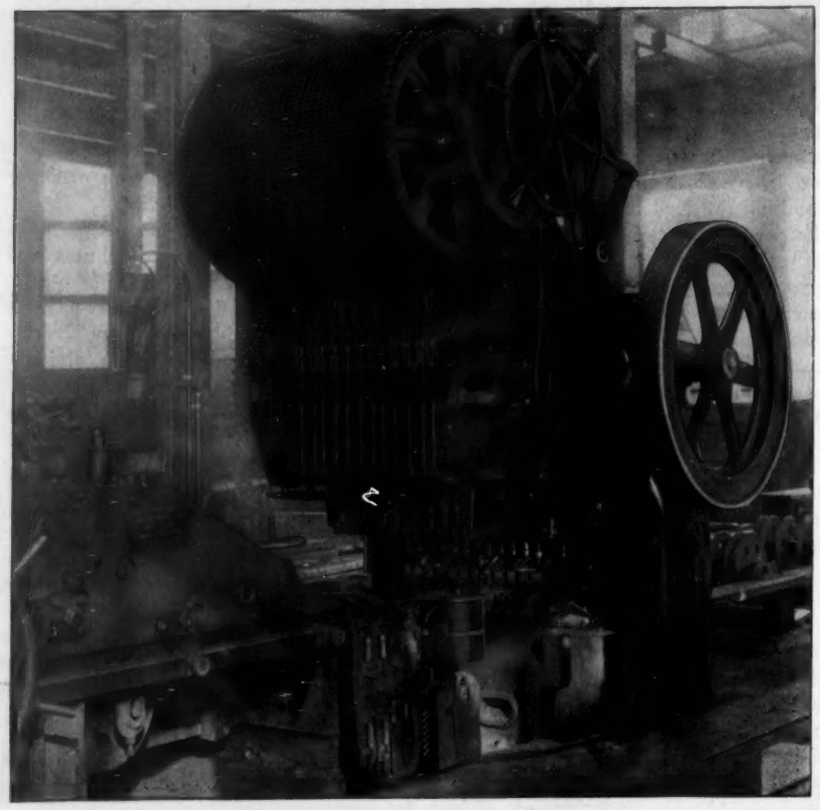
charged into a concrete shipping bin placed over the tracks. The tailings are conveyed to a stock pile by a 16-inch belt conveyor and are distributed by a small electric locomotive and a gable bottom car.

The power equipment consists of four 150-horsepower, 25-cycle, 440-volt, variable speed induction motors, a 50-kilowatt motor-generator set, one 6-horsepower and one 2-horsepower, 25-cycle, 440-volt, constant speed induction motors. One 150-horsepower motor drives the crushing department, three 150-horsepower motors drive the separating department, the 6-horsepower motor drives the tailings conveyor, and a small repair shop situated outside of the main building is driven by a 2-horsepower motor. The motor-generator set furnishes direct current for the magnetic separators, lights for the mill, and power for operating the electric tailings locomotive.

The switchboard controlling the separators is situated on the same floor as the machines, and is thus easily accessible to the operator. This board consists of a rheostat, ammeter and switch for each machine. The three motors driving the separating department are in a separate room between the two departments. In this room are also placed the stepdown transformers and switchboard for controlling transformers, motors, and motor-generator set.

This concentrating plant was designed and built for the purpose of handling low grade ore and remarkable results are said to have been obtained. The average results for the last three months were as follows: Crude, 33.35 per cent in iron; concentrates, 64.31 per cent in iron, and tails, 5.66 per cent in iron. The concentrates are of a high quality and fines have been eliminated to a great extent by graded crushing, close sizing and three part separation.

It is better to cause a delay than to cause an accident.



MULTIPLE PUNCH AND SPACING TABLE

Multiple Punch and Spacing Table

The Hilles & Jones Co., Wilmington, Del., recently has installed a multiple punching machine in the passenger car department of the Harlan & Hollingsworth Corporation, of that city. The machine is capable of punching at one stroke 18 holes, 9/16 inch in diameter, through a ¼-inch steel plate. The distance between housings is 50 inches. The punch is driven by a 20-horsepower motor, direct connected through cut gearing and fitted with a controller manufactured by the Electric Controller & Mfg. Co., Cleveland. With the punch is a Thomas spacing table and gagged control mechanism, furnished by the Standard Bridge Tool Co., Pittsburgh. This concern has installed a number of similar spacing tables and their operation is interesting.

The spacing carriage is driven by means of a roller chain, motor and magnetic coupling, located on the floor at one end of the table. The motor runs continuously, the break in driving mechanism being made in the magnetic coupling. As the carriage travels, a trigger or finger comes in contact with a pin on the templet, which releases the brake mechanism and stops the carriage at the desired point. The templet is made of wood, 2½ x ¾ inches in size. From the time the carriage trigger comes in contact with the templet pins until the carriage locks, the lead remains the same. By means of mechanical switches, the punch is set in operation when the carriage comes to rest.

The large drum, shown in the accompanying photograph is moved forward one space upon the movement of the sliding head. This drum controls the movement of the gags. It is equipped with a series of adjustable pins or thimbles by means of which the punches are brought into play by the shifting of the gags. The rows of thimbles on the drum are numbered to correspond with those on the templet spacing pins, this arrangement giving the operator an accurate check on his work.

The guns are operated on springs and are adjustable across the face of the punch in the same manner as the gags. The gags are released by a rocker arm which is operated by cams mounted on the shaft of the punch. A switch, also mounted on the shaft of the punch, is set to close a contact controlling a powerful magnet located on the carriage.

While the punches are stripping the material, an electric contact is made which releases the carriage and starts it on its way to the next stopping point. The gags are released by this contact and reset for the next movement of the drum.

These operations are performed rapidly, one complete cycle requiring about three seconds. The carriage is timed so that spacing up to 7 inches can be reached with the punch operating at the rate of from 18 to 20 strokes per minute. The control of the carriage and punch is electrical, the carriage itself being controlled by a drum type controller.

The blast furnace of the Leesport Iron Co., Leesport, Pa., has been blown out.

Fig. 1—Small parts stock room at St. Louis warehouse

Ryerson Warehouse At St. Louis

Hagar Name Will Be Retained and Large Additions Will Be Made to the Stock and Facilities Improved

ENTRY by Joseph T. Ryerson & Co. into the St. Louis market by the purchase of the W. G. Hagar Iron Co. marks a new departure in the business life of the Ryerson company and also in this line of business in St. Louis.

The Hagar plant, shown in the accompanying illustrations, will be known as the Hagar plant of the Ryerson company, thus preserving the historical associations clustering about the former ownership. The move was made to take better care of the Ryerson business in the south and southwest and to offer service not heretofore enjoyed by consumers at many points in that territory.

The Hagar plant is being restocked and reorganized to make its operations accord with up-to-date warehousing practice. In addition to the complete stock of mill, mine and boiler makers' supplies built up through 22 years operations in St Louis, the company will provide, in a perfectly equipped structural steel warehouse, a large stock of soft steel and iron bars, plates, concrete reinforcing material, sheets and metal-working machinery. The operating and selling organizations are being strengthened to meet the demands of enlarged business.

The Hagar plant occupies almost an entire city block, from Main to Second street on Clinton and Monroe streets, St. Louis. The shipping facilities are good but will be improved.

An Important Step

This expansion marks an important step in the progress of the Ryerson organization. Since 1842, when Joseph T. Ryerson opened his first iron store in what is now the loop district of Chi-

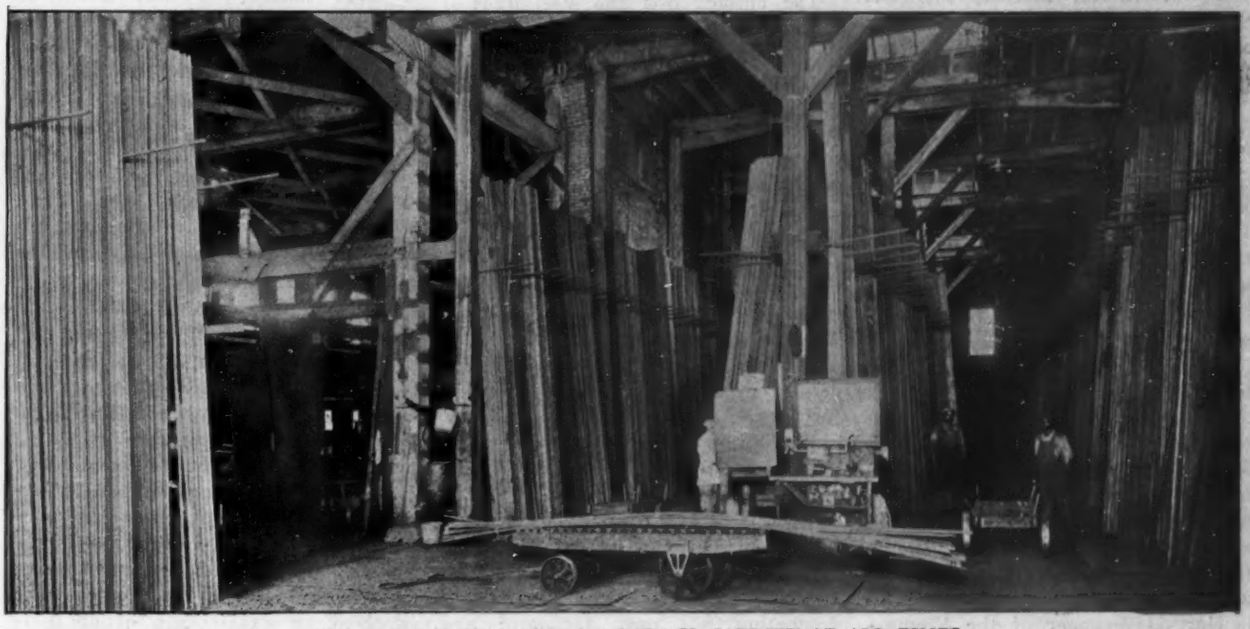


FIG. 2—A HEAVY STOCK OF BARS IS CARRIED AT ALL TIMES

cago, then on the outskirts of the city, the company has been expanding. Through their patronage of the facilities thus offered, steel users have encouraged improvement in methods, insuring accuracy in filling orders and speed in making deliveries.

When Joseph T. Ryerson went to Chicago, Nov. 1, 1842, the journey from Philadelphia consumed eight days by rail, stage and boat. He came as agent for Wood, Edwards & McKnight, Pittsburgh iron masters. He rented a store near Clark and Water streets and received a stock of $20,000 worth of steel. Soon he removed to a store at Dearborn and Lake streets. Late in 1844 he moved to 74 Lake street and in 1852 he bought a dock lot with an 80 foot front on the river at 218-224 Water street. He was derided for going so far out on the prairie. The building and stock were ruined by the great fire of 1871 but Mr. Ryerson rebuilt and continued business. About 10 years later a lot was bought at 18-22 Milwaukee avenue and a three-story office building and warehouse was erected. In January, 1892, two stories were added and in 1894 the adjoining lot was acquired and a five-story wing erected. In 1897 two more lots were purchased and buildings erected. Other additions were made until it was seen the business had outgrown its surroundings. A new plant at the present location, Sixteenth and Rockwell streets was then built. The first structures erected there were small compared with the present ones and the growth of the business has continued steadily until the plant now ranks among the most important of its kind in the country.

The new St. Louis plant will be in charge of A. M. Mueller, who has been assistant manager of sales for Joseph T. Ryerson & Son at Chicago for some years.

Republic Plants Busy

The Republic Iron & Steel Co., Youngstown, has renewed operations in its shafting department, and the company now is running at almost normal capacity. The shafting department was down several weeks.

The Concrete Steel Co., near the upper Carnegie mill, Youngstown, has completed plans for a steel and concrete addition, 100 x 200 feet, which will house a department for the manufacture and fabrication of steel novelties. The Concrete Steel Co. is said to be controlled by New York interests, and secures its steel material from the Carnegie Steel Co. John H. Hart is manager of the Youngstown works.

Quiet Precedes War Scare

English Market Shows Little Change In Days Before European Crisis

Office of THE IRON TRADE REVIEW, Prince's Chambers, Corporation St., Birmingham, Eng., July 24.

Birmingham, Eng., July 24.—Except for a little hardening of market tone, all branches of the British iron trade show substantially the conditions recorded during the past six weeks. The quarterly meeting has been followed by a certain amount of contracting in pig iron. The Cleveland market in particular has become decidedly more active, and prices are steady. A large number of contracts have been made in that district and consumers show more confidence, but sellers are chary of forward business and long contracts are the exception rather than the rule. In the Midlands, more iron has been booked, in some cases reluctantly by the smelters. Price concessions have been altogether out of the question. Business has become so unprofitable that furnaces will be blown out unless conditions improve. The general trade is injuriously affected by the political crisis, and it is thought a settlement of the Irish question would give a useful stimulus to business.

The selling price of warrants is now 51s 5d ($12.34) with an extra penny for three months. Little business is doing in east coast hematite, as consumers are bent on getting lower prices if they can do so, but makers believe they can maintain the present figure of 59s ($14.16) for mixed numbers.

The finished iron and steel trade is making only a moderate output, a condition partly due to the great heat of the past few weeks. While orders are not plentiful, some of the works have not been able to met the demands upon them on account of the scarcity of puddled bars.

Even in the present dull state of trade, a number of puddling furnaces are idle for want of men. Prices keep steady, marked bars easily maintaining the rather high figure of £8 10s ($40.80). The South Yorkshire Bar Iron Association, at a meeting a few days ago, decided to continue the basis quotation for bars of £7 5s ($33.70).

Foreign competition has asserted itself strongly lately in the department of wire and wire products. British mills just manage to keep in operation; but the increasing importation is regarded as disquieting, especially as Germany is increasingly competing not only for wire and small rods but also for the supply of tacks, nails, screws, rivets, staples, etc. A new innovation is the sending of screw blanks into Birmingham merely to have the finishing "worm" developed. In several departments Germany is making a bold bid for the finished business in preference to the supply of billets, rods and half-finished material, with which she has hitherto been content. Galvanized sheets continue to maintain a large output and inquiries are improving, but without any material effect upon prices. There are gratifying signs of recovery in the tin plate business, consumers showing sufficient confidence to place good forward orders. Some contracts recently made will run as far as next June. At the same time, it is thought the policy or restriction must be carried still further, and a general stoppage is being arranged covering every mill in South Wales for August bank holiday week and the week following.

Steel Sash Catalog

An unusually handsome catalog covering various forms of steel sash, steel doors, sash operating devices, etc., has been issued by David Lupton's Sons Co., Philadelphia. The book contains 84, 8½ x 11-inch, pages and in addition to complete information and drawings covering the construction of numerous types of sash, a large number of illustrations of actual installations are presented. The data given covering the steel sash, doors, etc., in the new laboratory of the General Electric Co. at Schenectady, N. Y., will be found especially interesting. The catalog gives considerable space to the Pond continuous sash, which has been found especially suitable for monitors and side walls of foundries, machine shops, rolling mills and similar structures.

The Dravo-Doyle Co., Diamond Bank building, Pittsburgh, has been awarded contracts for two 1,500 horsepower turbine driven centrifugal pumps for the city of Philadelphia. Each pump has a capacity of 20,000,000 gallons against a head of 334 feet. They are duplicates of one recently installed by the Dravo-Doyle Co., at Cleveland. The Philadelphia contract involved an expenditure of approximately $80,000.

Alleged Blackmailers Indicted

Bills Found Against Business Agents of Chicago Unions—Other News Items Relating to Employers and Employes

Chicago, Aug. 4.—First indictments against business agents of labor unions in the effort to eradicate the evil of blackmail by these agents have been returned by the Cook county grand jury. This action is independent of the inquiry by United States Attorney Wilkerson before a special federal grand jury mentioned in these columns last week.

The indictments are against Roy Tangney, assistant business agent of Machinery, Safe Movers' and Riggers' Union, local No. 714, and Christopher Dunne, business agent of the Van Teamsters' Union.

The indictments charge conspiracy to extort $250 from William H. Marshall of Marshall Bros. Express Co., in connection with unloading boilers for a public school in South Chicago.

Tangney was arrested after receiving $150 in marked bills, falling into a trap set by Mr. Marshall and State Attorney Hoyne of Cook county.

A new angle of the blackmail investigation before the federal grand jury has just appeared. Two witnesses have told United States District Attorney Wilkerson of efforts by "Mike" Boyle, formerly business agent for an Electricians' Union, to collect a "slush" fund with which to "fix" the matter with Mr. Wilkerson's office.

Rumors of Boyle's activity in attempting to obtain contributions to a fund for this purpose came to the ears of federal officials and on investigation two men were found who are said to have admitted they had been approached for money for the purpose of "fixing things in the federal court."

Ousted From Membership

The Chicago Building Trades Council has ousted the Sheet Metal Workers' Union from membership, and unseated its business agent, after investigation of charges that the union condoned the acts of blackmail by the latter. This is the second union ousted from membership of the Building Trades Council and a third organization has been given notice that action will be taken Friday night of this week unless it gets rid of its business agent before that time. This is the union of wood, wire and metal lathers.

Tom Walsh is the Sheet Metal Workers' business agent and about two years ago his alleged career of blackmailing started. Outside sheet metal workers have found it impossible to do business in Chicago. Builders of the Continental and Commercial National Bank's new home learned this lesson, as well as many others. About a year ago, Walsh failed to mulct the American Laundry Machine Co. for $350 when some of its material was shipped from Rochester, N. Y. The Building Trades Council at that time, through President O'Donnell, called off the strike which Walsh had started.

When Walsh learned the American Laundry Machine Co. had the contract for the new Morrison hotel, he demanded the contract be cancelled. On refusal, he called a strike. This came to the attention of the Building Construction Employers' Association and was referred to the Building Trades Council, with the result that the union has been dropped by the latter organization.

No Use for Crooks

Simon O'Donnell, president of the Chicago Building Trades Council, commented on the incident as follows:

"Just as fast as crooks are shown conclusively to be using the name of unionism for their personal gain, they will be ousted by the unions themselves. If the unions do not realize the necessity of firing these crooks to keep unionism clean, the unions themselves will be ousted.

"The unions simply stood for these fake and unnecessary strikes and what the strikes were intended for, and the council couldn't afford to be put in a position of sanctioning such things. The council will take such action at any time whether anyone else ever hears of it or not, when the policy and object of the trades council are violated in so brazen a manner.

"Less than one per cent of labor representatives are crooked, but these acts, if not stopped, throw discredit on all labor. We can't afford that, and we won't. When the same course is persisted in by any other union, it will follow the two ousted."

Wages in Italy

With more Italian immigrants admitted to this country last year than immigrants from any other European country, perhaps the reason may be found in the scale of wages recently adopted at Siena, Tuscany, in settlement of a strike. The settlement on the basis of a 10-hour work day is as follows: Stonemasons and bricklayers, first class, per day, 63 to 72 cents; second class, per day, 59 to 68 cents; third class, per day, 55 to 63 cents; helpers, per day, 35 to 46 cents; stonemasons and bricklayers at Leghorn are paid 77 to 96 cents per day.

Go Slowly

And Think Carefully—Warning From Commissioner Hibbard

Chicago, Aug. 4.—That the present is a time to go slowly, use conservatism and be extremely careful in view of all the factors entering into the business situation is the opinion of John D. Hibbard, commissioner of the National Metal Trades Association, Chicago.

"The present war in Europe will put millions of men into the field, will result in the destruction of millions of dollars' worth of property, which will be as absolutely lost as though it had been sunk in the sea and the expense of maintaining the armies and the loss of the labor of so many thousands from industry.

"This country seems the best situated in the world to escape the dire results of this war, if we are able, as I believe we will be, to escape entanglements. Our fields and industries probably will be called on to supply much for food and for war purposes and fortunately we have an immense crop coming. Conditions seem excellent for us to profit for the immediate future from this situation.

Effects of War

"But this destruction of property and cessation of industry will be a loss that never can be made up and we will have to suffer with the rest when the burden of readjustment begins to settle down.

"Only two things appear to me possible to disturb our position. One is failure of the crops to materialize as we have expected them. A crop never is safe until it is harvested and sold. The other thing is a labor war.

"It seems to me the last thing employers and employes should do at this time is to engage in a widespread struggle over any matter which threatens to disrupt the peace of the industrial world. It is not a time for expansion of industry, because capital is suffering keenly from depreciation of values and labor also is suffering from lack

of opportunity to find employment. Everything is in a situation counseling moderation and self control until the issues are clearer."

Dynamiters

Return to Prison—Some Released By President Wilson

Washington, Aug. 3.—A number of the dynamiters who were convicted at Indianapolis have been compelled at last to return to Leavenworth to serve their sentences and most of them have apparently abandoned hope of pardon. The sentence of Frank M. Ryan, president of the Structural Iron Workers' Union, is seven years. Others were sentenced to serve from three to six years.

Those in the penitentiary at Leavenworth are:

Frank M. Ryan, Jack Bright, John T. Butler, Eugene A. Clancy, Philip A. Cooley, Herbert S. Hockin, Frank C. Webb, Edw. Smythe, Michael J. Young, John H. Barry, Peter J. Smith, George Anderson, Ernest G. W. Basey, Chas. N. Beum, W. Bert Brown, Henry W. Legleitner, Paul J. Morrin, William H. Reddin, Frank J. Higgins, William Bernhart, J. C. Munsey.

Those whose sentences were commuted by the President June 22 to expire at once are:

Frank K. Painter, Fred J. Mooney, and William Shupe. No reason for commutation was given aside from the fact that the action was based on the evidence in the case.

Those who have been paroled (not pardoned) are:

Murray L. Pennell, paroled July 6; Michael J. Cunnane, paroled July 7.

Those who have been granted new trials and are out on bond are:

Olaf Tveitmoe, Michael J. Hannon, William J. McCain, Fred Sherman, Richard H. Houlihan, James E. Ray.

Decision as to executive clemency for John H. Barry and Paul J. Morrin is to be reserved for consideration on receipt of separate petitions to be filed. Other cases have been denied.

Continues an Open Shop

About 100 machinists at the plant of the DeLaval Steam Turbine Co., Trenton, N. J., struck several weeks ago as part of a general strike of machinists in that city, though hours, wages and conditions were all that the workers asked. Recognition of the union was demanded and refused. New men were obtained and the shop continued in operation as an open shop.

Messrs. J. & C. C. Bolinders Co., of Stockholm, Sweden, have organized the Bolinders Co., and established offices at 30 Church street, New York City, for the purpose of marketing the Rundlofs crude oil engines in this country. The Bolinders Co. has been manufacturing these engines in Europe for twenty years. The engine is of the 2-cycle type without valves and the design is, therefore, exceedingly simple.

Will Default

On Interest on Account of the Low Prices Prevailing

The Central Iron & Steel Co., Harrisburg, Pa., in the hands of receivers since Feb. 6, 1912, has notified holders of the 5 per cent first mortgage bonds that receivers will default on the semi-annual interest due Aug. 1. Though the sinking fund provision of the bonds has not been complied with, the interest has always been paid until this time, when adverse business conditions have made it impossible.

Charles J. Rhoads, vice president of the Girard Trust Co., chairman of the bondholders' committee, says the committee has the right to bring a foreclosure suit at any time, but does not consider doing so at present, as the receivers have shown good management and the firm could easily make money if steel products prices would improve slightly. Outstanding bonds total $1,239,000; Girard Trust Co., trustee. It is stated that efforts to sell and reorganize have been under way.

May Double Output

The McKeesport Tin Plate Co., which has a 22-mill tin plate plant at McKeesport, Pa., is contemplating an extension which will practically double the output of the mill. Plans under consideration include the installation of 20 additional mills for the manufacture of tin plate. A definite decision will not be reached for several weeks.

Secret Ballot Proposed

The following resolution was adopted by the Windmill Manufacturers' Club at a recent meeting which was held in Chicago:

"We would favor laws that would prevent the calling of a strike without a secret ballot of all men composing the membership of the union affected, as it is notorious that a large majority of strikes are called by labor officials against the real desire and voice of the men forming the union."

Engineers Club of Trenton

Trenton, N. J., Aug. 3.—The Engineers' Club of Trenton was recently organized and now has a membership of more than 200. The club is the only engineering organization in this city and its membership represents all the Trenton iron and steel plants as well as some other factories.

At the regular monthly meetings, interesting papers are read by prominent out-of-town engineers. During the coming winter the club will have illustrated talks on engineering matters.

Following are some of the prominent members:

Charles E. Hewitt, civil engineer, 50 Church street, New York City.

William Hewitt, (past president American Society Mechanical Engineers) American Steel and Wire Co.

Herbert S. Hunt, assistant mechanical engineer, American Sugar Refining Company, Brooklyn, N. Y.

George A. Johnson, consulting sanitary engineer, New York.

Rankin Johnson, president Trenton and Mercer County Traction corporation.

Frank W. Kennedy, general manager, De Laval Steam Turbine Co.

Henry L. Laning, assistant engineer of construction, Philadelphia and Reading Railway Co.

Harry B. Lapp, general superintendent, De Laval Steam Turbine Co.

George W. Lenox, chief engineer, Trenton Water Works.

Charles Lindeemer, superintendent brass department, J. L. Mott Iron Co.

M. P. Morrison, tramway engineer, American Steel & Wire Co.

A. P. Nelson, testing department, American Steel & Wire Co.

Henry R. Patterson, superintendent American Steel & Wire Co.

William Henry Plane, superintendent and designer, Reeves-Cobberley Engine Co.

Clyde Potts, New York, consulting sanitary engineer.

John V. Rice, Jr., Bordentown, president Rice Gas Engine Co.

Charles G. Roebling, president John A. Roebling Sons Co.

Ferdinand W. Roebling, Jr., John A. Roebling Sons Co.

Karl G. Roebling, John A. Roebling Sons Co.

W. E. Sanders, Philadelphia, mechanical engineer.

Frank W. Bunn, mechanical engineer John A. Roebling Sons Co.

Fred C. Carstarphen, mechanical engineer, American Steel Wire Co.

Frank J. Eppele, general manager, Trenton Malleable Iron Co.

Chas. F. Goodrich, assistant engineer American Bridge Co., New York City.

New York's Ore Output

New York state, in 1913, produced a total of 1,606,196 gross tons of iron ore of a value of $3,870,841, according to the annual report of Dr. John M. Clarke, state geologist. This tonnage of ore was produced in the Adirondack mountains, in the highlands of Orange county and in the Clinton district. It was produced by 10 companies.

No Danger of a Shortage of Labor

Due to Iron and Steel Plant Employes Going to Europe to Fight—Considerable Excitement in Some Cities Among Foreigners

New York, Aug. 3.—Thousands of volunteers and reservists for the Austrian, Servian, Russian, Greek and Italian armies have been enrolling their names with the consulates of their countries in this city and Philadelphia during the past few days prepared to respond to the colors and to the call of the fatherlands. The Austrians and Serbs especially, in large numbers have been putting themselves in touch with the representatives of their native governments and now await final arrangements to be made for their transportation to Europe. In lesser numbers, the Russians, Greeks, Italians and Germans have been communicating their addresses to the authorities and their readiness for any call of duty. In some cases in Philadelphia, drills are being conducted by the volunteers themselves.

In the event that the war situation in Europe continues to threaten many of the powers, it is made evident by the developments of the past few days that thousands of foreign workmen now employed in the metropolis will return to Europe, if a way is provided for them. How large this army of men would be, it is difficult to state owing to the complexity of the situation and to the many nationalities that would be involved directly or indirectly. It is easy to see that this movement might run to upwards of 100,000 men. It is predicted that the number from Philadelphia and vicinity will reach about 20,000. Already 11,000 Austrians and Hungarians have been enrolled at the consulate in that city.

The greatest problem that now unfolds before this rush of foreigners to the defense of their home countries, is the inability of the representatives of the various nations to provide means of transportation for these men. This is the big question that now faces the respective consular representatives in this city, Philadelphia and other eastern seaports. From all over the country, the movement of men towards New York and other leading ports is under way, but there is no assurance at the present time that their transportation across the Atlantic will be accomplished. The cancellation of sailings by leading steamship lines has greatly complicated the problem and unless special facilities are provided, it is evident that the carrying of the thousands back to Europe will be brought about very gradually if at all. This factor may tend to make the exodus of workmen from the iron and steel works, mines and other industries throughout the country, smaller than otherwise would be the case were so many of the large powers now actively engaged in the passenger steamship traffic not involved in the present crisis.

Many Ready

To Fight for Fatherlands—More Willing to Stay at Home

Chicago, Aug. 3.—War movements in Europe have been reflected among steel workers in the Chicago district and preparations are being made for many to return to their native lands to fight for their flags. In the steel towns south of Chicago along the lake, Gary, Indiana Harbor, South Chicago, and other places, meetings are being held and men are being enlisted for service.

With a surplus of labor available in all these localities, a large number of these nationalities can be spared before the movement will affect the labor market in any degree. Steel and iron plants are working far below full force and no pressure will be felt until several thousand men have gone back to Europe. It seems probable the drain would have to be much larger than it promises to be before its effect will be felt severely.

A meeting of Servians at Gary last week resulted in a great demonstration and 1,100 men signed enlistment blanks. The first company, consisting of 75 men, has started for New York to sail for Southern Europe. Other detachments will follow as funds are available. No men will be sent forward until means are in hand to see them through. The recruits are Croatians, Delmatians, Bohemians, Galicians and Slavs, all subject to Austria, but eager to serve against their country in aid of the Servians, whose blood brothers they are.

An enlistment office is open at Gary and another in Chicago, at headquarters of the South Slavic Federation, 2296 Clybourn avenue. J. R. Palandech, Serb leader, says there are 30,000 strong, young Slavs eager to return to fight and if needed, they will all go back. Funds are being collected and matters are progressing in an orderly way.

Austrians are also active and have held a meeting at Gary to pledge their services to the home land, if they be needed. Russians, of whom there are said to be 10,000 in this vicinity capable of bearing arms, also are organizing and express their intention of joining their national colors, if needed.

A riot was narrowly averted Friday night at South Chicago when a company of Russians started drilling on the streets and word of this was conveyed to a meeting of Austrians in another portion of the city. Police were called and prevented a collision.

Numerous meetings have been arranged and headquarters opened, while leaders of various nationalities are endeavoring to control the excitement among the more ignorant and to have matters move in an orderly way.

Most of the men likely to go back to Europe are from the laborer class, comparatively few being skilled workers, and their departure will not affect the skilled trades as deeply as the common labor situation.

Although there is much noise and froth over the situation, there also is a considerable proportion of men from the various European countries who have become imbued with American ideas and are not affected by the situation, preferring to remain here where they have made their homes and to attend to their business, letting the home countries look out for themselves.

Not Many

Are Expected to Leave Cleveland Plants to Go to War

Cleveland, Aug. 4.—In the Cleveland district, there has been considerable excitement among the Austro-Hungarians, Serbs and Croatians. Twenty-four Austro-Hungarians and two Serbs were the first to start for New York last week, and others have followed, but it is not believed that many will go from Cleveland to foreign lands. At the large plants of the American Steel & Wire Co., the Otis Steel Co. and other iron and steel concerns, there is apparently very little agitation among the workmen and few have quit their jobs. The general manager of one very large company, after carefully surveying the situation, Monday, felt perfectly safe in starting on an extended vacation.

Stirred by messages relating to the war in Europe, members of the South Slavish Socialist party, protesting against war, paraded the down-town streets, Sunday, and made a noisy

demonstration in front of the windows of the Austro-Hungarian consulate in the Leader-News building. The mob was dispersed by the police at the call of officials of the consulate. Vice Consul Pelenyi has given instructions to his countrymen who wish to engage in patriotic demonstrations to desist. Many workingmen are declaring that they are much better satisfied with conditions in this country than they were in Europe and do not intend to do anything to help the countries of their nativity.

Good Molders

Not Likely to Leave This Country in Large Numbers

The migration of those foundry employes of foreign birth who would be most likely to leave the United States for Europe in the event of a general European war would not be as disastrous to the foundry trade in this country as it would seem at first thought. A large proportion of these men who would return to fight for their countries would be of the Slavonic and Hungarian nationalities. These people do not make very good molders and very few of them have reached the top of this trade, and although they should leave the country in large numbers, their loss would not be seriously felt. As to the Germans, among whom some of the best molders are to be found, about 99 per cent of them employed in American foundries are American citizens, and would have no motive to return to their native land to enter the war. The Russian molders in the United States, of whom there are only a few in comparison with the Slavs, Hungarians and Germans, are also classed as being very efficient, but their migration could not bring about a serious handicap because of their scarcity of numbers. The Scandinavians are also very good molders, but they are widely scattered throughout the country and are so few in number that their loss would barely be felt. Taking the situation as a whole, a call to arms of Europeans employed in American foundries could not bring a serious handicap to that industry.

Anxious To Return

Sharon, Pa., Aug. 3.—Slavs, Austrians and Serbs held mass meetings here yesterday, and listened to patriotic speakers from Cleveland and Pittsburgh. Foreigners express a desire to return to their native lands and mills will be affected if they can succeed in obtaining necessary funds to get back to Europe.

Prefer Jobs

To Muskets and Will Not Rush to Enlist For War

Pittsburgh, Aug. 3.—Mill managers at this center do not appear alarmed over a possible labor famine, as a result of the war abroad which involves nearly all of Europe. Although it is known that many foreign-born laborers have expressed intentions of returning to their native lands, iron and steel plant owners say they do not believe the rank and file of foreign employes will give up jobs to shoulder muskets. Decreased mill schedules the last eight or nine months have made it extremely difficult for unskilled laborers to "keep the wolf from their doors", and it is not believed, say employers, that these men will quit work. Serious doubt is expressed by those closely following developments resulting from the situation abroad whether foreigners could join their countrymen even though they wanted to, because of the withdrawal of foreign ships.

If efforts of a central committee of Slavs in this district are successful, few Austrian Slavs will attempt to go to the front. Slavs have organized here, as elsewhere throughout the country, determined to cut off every possible fighting unit, by dissuading subjects of Austria on answering the call to battle. The committee has raised funds to finance its campaign.

Big Drop

In Earnings of Republic—Chairman Notes Improvement

Earnings of the Republic Iron & Steel Co., Youngstown, for the six months ended June 30, 1914, according to Chairman John A. Topping, "emphasized the general effect on business resulting from tariff reductions and trade hesitation, incident to the enactment of new laws and the discussion of radical legislation".

Profits applicable to dividends fell short of dividend requirements of 3½ per cent by $256,224. Dividend requirements were $875,000, the balance being paid out of the previous surplus.

To meet these conditions, the company reduced its costs, compared with the preceding six months, by approximately 8 per cent, without reducing labor rates. The selling prices of its principal products were lowered 20 per cent. The volume of business contracted about 33 per cent, as measured by the company's capacity. Unfilled orders, on June 30, were 214,895 tons, compared with 120,959 tons on December 31, last, and 504,928 tons on June 30, 1913. Pig iron orders on June 30 were 86,992 tons, compared with 49,296 on Dec. 31, last, and 59,906 tons on June 30, 1913.

Mr. Topping notes that the prospects for business have improved. "The outlook for increased business is favorable," he says. "June business shows a large increase as against the preceding month, and it is believed that the movement will extend itself on account of the large harvest of wheat under way and the general excellent prospects for other crops. A return, however, to normal earnings may be slow on account of the low tariff, as values of steel products should, in the future, move more in sympathy with the world's supply and demand, rather than as heretofore, with domestic market influences. There are, however, at this time some indications of improvement in the world's markets, so that there is a prospect of improvement in value."

Comparative income statements for the past six months and for the corresponding six months of 1913 follow:

	1914.	1913.
*Net earn. from oper...	$1,316,731	$2,776,647
Int. & divs. from inv...	5,100	31,783
Total profit	$1,321,831	$2,808,430
Depreciation, etc.	178,882	283,391
Exhaust. of mining.....	109,285	112,145
Total deductions	$ 288,167	$ 395,536
Net profits	1,033,664	2,412,894
Interest	414,888	440,473
Surplus	$ 618,776	$1,972,421
Preferred dividend.....	875,000	875,000
Deficit	$ 256,224	†$1,097,421
Previous surplus	6,512,778	6,661,478
P. and L. surplus....	$6,256,553	$7,758,898

*After deducting charges for maintenance and repairs amounting to $742,100 for 1914 and $872,902 for 1913.
†Surplus.

Enlarge Lagonda Plant

The Lagonda Mfg. Co., Springfield, O., is building an addition to its plant to accommodate increased business. In spite of the prevailing business depression, it is stated that the plant of this company is running night and day and that the organization is fortunate in having more business on hand at the present time than it has had for years. The company manufactures boiler tube cleaners, turbine and mechanically driven scale removers, valves, water strainers, etc. The new addition will be 60 feet wide and 110 feet long, of brick and concrete construction with a steel supported, slate, monitor roof. A new 34-inch Gisholt automatic lathe, a large multiple drill and a radial drill will be installed in the new extension, which will be provided with a 10-ton electric crane with a span of 36 feet. To cover increased demand for power, a new 100-horsepower gas engine will be installed.

Ore, Coal and Coke Not Included

In Advances Granted Railroads by Interstate Commerce Commission—Finished Products in Central Freight Association Territory Will Have Higher Rates

Washington, Aug. 4.—Doling out a 5 per cent increase on all class and some commodity rates in Central Freight Association territory, the Interstate Commerce Commission in its decision in the rate advance case of the eastern railroads last Saturday, pursued a course which, of late, had been predicted generally. No increase whatsoever was granted outside of that territory, which is represented by a line from Buffalo to Pittsburgh down to the Ohio river and west to the Mississippi river.

Increases on coal, coke and ore were denied, the only pig iron making material which will be increased by the new tariffs being limestone and this advance will be confined, as are all other advances, to Central Freight Association territory. Semi-finished and finished iron and steel articles which take the fifth class rate in that territory, will be subjected to the increase when transported through that section, where are situated great steel mills, such as those of Buffalo, Pittsburgh, the Shenango valley of Pennsylvania, throughout Ohio and Indiana and at Chicago.

To the steel maker the foregoing represents the burden of additional freight charges he will have to pay.

The paragraph of the opinion covering entirely the increases granted, follows:

"The commission finds that the carriers operating in Central Freight Association territory are entitled to an increase not exceeding 5 per cent on all class and commodity rates wholly within that territory, except the rates on coal, coke, iron ore, cement, brick, tile, clay, starch and plaster, as to which the carriers did not sustain their burden of proof, and any rates which are controlled by specific unexpired orders of the commission. The proposed increases in lake-and-rail rates between Central Freight Association territory and other portions of Official Classification territory are disallowed. The effect of the findings is also to disallow the application of the proposed minimum increase of 5 cents a ton on those commodities for which a charge is now made of less than a dollar a ton. This minimum increase, in some instances, would have resulted in increasing rates as much as 25 to 50 per cent."

While none of the commissioners or Attorney Louis D. Brandeis, special counsel for the commission in the case, would even estimate what the increased rates allowed will mean, interested attorneys have said that it will not amount to more than $10,000,000 annually. It is plain that the railroads would consider the increase as being inconsequential as compared with their requirements. The full increase would have netted $50,000,000. The commission, too, after saying that the class rates effective in Central Freight Association territory are so low that an increase of 5 per cent would clearly not be unreasonable, and pointing out that the "class rate structure in that territory is honeycombed with inconsistencies", indicates the belief that further action will be taken by representatives of railroads in that territory. During the hearings they gave express notice that lines in that territory, if the 5 per cent increase were allowed, would "in due time file tariffs and bring the matter to the attention of the commission." So efforts for further increases in that territory are being expected.

Victory For Shippers of Low Grade Commodities

The following statement in regard to the decision in the rate advance case was made by Attorney Wade H. Ellis, member of the Washington law firm of Ellis & Donaldson, who represented the Pittsburgh Steel Co., and made a strong protest against any increase in the rates on low grade commodities:

"The Interstate Commerce Commission has followed the line in previous cases which developed tremendous differences in the cost between the transportation of low grade commodities and class freight. This conclusion, no doubt, was also reached in view of the fact that class rates have remained stationary a good many years, while low grade commodities have received their full measure of advance the past 10 years and are today out of line with class rates generally. The decision is a distinct victory for shippers of low grade commodities, such as coal, coke and ore."

The majority opinion, prepared by Chairman James S. Harlan, was dissented from by Commissioners Charles C. McChord and Winthrop More Daniels. The latter holds that the 5 per cent advance should have been accorded generally. Commissioner McChord said it was not in harmony with the general basis of rate adjustment that has so long existed in Official Classification territory to approve in Central Freight Association territory the increases proposed and to deny increases to the trunk lines, which, he said, seems unwarranted by the facts.

Views expressed by Attorney Brandeis at the hearings and arguments and his general activities are mirrored in the majority report It sustains the contention of the railroads that their revenues under the present scale of rates are inadequate and points out that "the operating revenue of the railroads in Official Classification territory, taken as a whole, is smaller than is demanded in the interest of both the general public and the railroads."

In thus recognizing the present financial difficulties of the railroads, the commission offers 16 suggestions and recommendations as remedies. They follow closely suggestions made by Mr. Brandeis. They include such matters as conferences between state commissions, the carriers and representatives of the public with a view to advancing such passenger fares as may be shown to be clearly unremunerative, increasing rates which are unremunerative through examination of them, and rules and regulations, and suggestions as to abolition of so-called free services, etc. One suggestion plainly implies that the commission favors the divorcing of common interests in railroads and industries, thus following intimations made in the industrial railways decision.

It is claimed that increased rates which are allowed will afford "some relief to practically all the lines in Official Classification territory, which are in need of additional revenues, except the New England lines." The commission denies there is a crisis or cause for alarm in the railroad situation, and sees no reason "why our American railroads should not enjoy a large measure of prosperity consistently with just and reasonable rates."

The dissenting opinion of Com-

missioner Daniels carries this caustic comment with regard to the majority report:

"The proposals in the majority report whereby carriers may conserve their revenues without advancing their rates are held not to constitute a necessary or proper function of the commission in deciding a plain issue as to the reasonableness of suggested rate advances. Many of the expedients are ingenious, some of them are promising, most of them are remote in possible effect, and all of them pale into insignificance as against the admitted economies in fuel and the heavier car and train loading attained by the carriers within the last few years."

In referring to differences in freight transportation costs, the majority report says:

"The evidence is clear that as to certain classes of bulk or heavy freight, like coal, coke, ore, cement, brick, tile, clay and plaster, the use of larger cars must have reduced operating costs, whereas in respect to expedited package freight, shipped in cars moving on a regular schedule regardless of the quantity of their contents, the use of larger cars, involving greater unused car capacity must have increased the operating costs."

Attorney Wade H. Ellis of this city who represented the Pittsburgh Steel Co. and made a most vigorous protest against increase in rates on low grade commodities, submitted an array of facts to defend his argument and at least partial reference must be made to it in the following paragraph:

"With respect to certain heavy commodities, namely brick, tile, clay, coal, coke, starch, cement, iron ore, and plaster, protestants made such a showing as to constrain us to hold that the carriers failed to sustain their burden under the statute."

The majority report finds that the financial condition of the trunk line carriers does not warrant a general increase of freight rates and recites facts to show that the needs of the New England lines are being cared for locally. These lines with those of Central Freight Association territory constitute the entire section affected in the case.

The Terminal Warehouse Co. of Rhode Island, has received the permission of the government to establish a private bonded warehouse for the handling of imported merchandise at the foot of Oxford street, Allens avenue, Providence. This is to be the first bonded warehouse in the state of Rhode Island.

Large Increase

In Cost to Shippers at New York Would Be Caused By New Tariff

Washington, Aug. 4.—Acting upon suggestions made by Attorney Louis D. Brandeis during hearings before the Interstate Commerce Commission in the advance rate case of eastern railroads, it is reported that standard rail lines are preparing to file tariffs providing for the abrogation of free cartage service in connection with import traffic at New York. The claim is made that the tariffs will be filed to become effective on Sept. 1 or soon thereafter.

Operation of such tariffs would mean that the cost of free cartage service would not be absorbed, nor would allowance be made therefor, or for lighterage in lieu of cartage. The roads said to be proposing the tariffs include the New York Central, the Baltimore & Ohio, the Delaware, Lackawanna & Western, the Pennsylvania lines, the Lehigh Valley, the Erie, the Central Railroad of New Jersey, the New York, Ontario & Western and the Lake Shore. The tariffs, if permitted to become effective, would result in a great saving to the railroads, and at the same time mean a vastly increased cost for importers and jobbers through the New York port.

Conflict

In Decisions of Interest to Steel Plants Having Railroads

Washington, Aug. 4.—Transportation circles in this city attach significance to an opinion handed down last week by the Interstate Commerce Commission as having a probable effect toward supporting the contentions of those who say allowances cut off from steel plant lines should be restored. The decision related to the case of the Decatur Navigation Co., operating four boats on the Tennessee river for a distance of 110 miles above and 25 miles below Decatur, Ala., and through an order entered with the decision, the Louisville & Nashville must on or before Oct. 1 make through route and joint rate arrangements with the Decatur company.

Objection to making such an arrangement was made by the railroad on the ground that the service by another boat line is satisfactory and is sufficient to care for the river traffic and that the Decatur line is a "plant facility" for the Hitt Lumber Co., most of the tonnage consisting of logs and lumber from that institution. In the industrial railways case, affecting steel plant lines, the latter were held to be plant facilities, although it was conceded in the decision that outside traffic carried by the steel lines ranged from one-fourth of 1 per cent to a maximum of 12.66 per cent on the South Buffalo railroad, owned by the Lackawanna Steel Co.

The Decatur company decision apparently is in direct conflict with the finding in the industrial railways case, and at the same time follows closely the finding of the Supreme Court in the case of the tap lines of the south, by which the commission's decision with regard to those lines was reversed. Those cases and the industrial railways case are held by many to be analogous.

Commissioner Daniels, who prepared the opinion in the Decatur case, submits this interesting paragraph:

"It cannot be said that a transportation company is not a common carrier merely because a considerable portion of its business consists of freight carried for itself, or for the industry with which it is associated."

Early Action

Is Expected on Petition of Railroads For a Reopening

Washington, Aug. 4.—Action is expected to be taken by the Interstate Commerce Commission in the near future on a petition of railroads seeking a re-opening of decided cases relating to rates on iron and steel articles to points throughout the west and consolidating them with five pending cases involving similar products and points in common. The roads want a general hearing on all the cases, instead of separate hearings in each, and hope to have the matter disposed of after summer recess, perhaps, in Washington. If they are successful, it will mean one of the most important hearings of the kind ever conducted by the commission.

The five cases as to iron and steel articles now before the commission to which the roads have reference pertain to rates from the Mississippi river, Ohio, Pennsylvania and other points to Wichita and Topeka, Kan.; Oklahoma City, Okla.; Kansas City, Mo.; Denver, Colo., and other points. The petition points out various cases involving iron and steel rates to the west which have been decided and ask that they be reopened, claiming all of them, along with those pending, are interrelated. Among the decided cases is that of the Vulcan Iron Works Co., in which the commission reduced rates on structural material to Denver and other Colorado points.

Splendid Program for Convention

An Unusually Interesting Series of Papers Insures Success of American Foundrymen's Association Meeting

The proceedings of the forthcoming convention of the allied foundry associations, which will be held in Chicago, Sept. 7-11, promise to eclipse all previous efforts in both volume and character. Nearly 40 papers and reports will be presented and discussed by the members of the American Foundrymen's Association at their various sessions and the American Institute of Metals and the Associated Foundry Foremen will be equally well represented. This will be the first convention at which the foundry foremen have had any professional sessions.

The program has been so arranged that related subjects will be considered together and this feature will appeal to those visitors who are limited in time and also are interested in one particular subject or branch of foundry practice. A partial list of the papers and reports follows:

Papers on Safety Work

"Safety in Foundry Operations," address by M. W. Alexander, General Electric Co., West Lynn, Mass.

"Safety First", by W. F. Reidenbach, Genesee Metal Co., Rochester, N. Y.

"Progress in the Safety First Movement," by Arthur T. Morey, Commonwealth Steel Co., St Louis.

"Safety in Connection with Grinding Wheel Operations," by R. G. Williams, Norton Co., Worchester, Mass.

"Safety and Sanitation," by A. W. Gregg, Bucyrus Co., Milwaukee.

"Safety First—Driving Back the Saloon," by Thomas D. West, Cleveland.

"Sanitation and Safety First as applied to the Brass Industry", by F. Moerl, Chicago.

Foundry Equipment and Appliances

"Electric Motors and Controllers for Foundry Operation," by S. H. Libby, New York.

"The Second Story Foundry," by G. K. Hooper, Hooper-Falkenau Engineering Co., Detroit.

"Economics of Motor Drive," by H. F. Stratton, Electric Controller & Mfg. Co., Cleveland.

"Abrasives in the Foundry," by Mr. Dietz, Norton Co., Worcester, Mass.

"Refractory Material," by Mr. Kelly, Harbison-Walker Refractories Co., Pittsburgh.

"Molding Sand Tests," by Dr. Richard Moldenke, Watchung, N. J.

Gray Iron Session

"Cast Iron With Unusual Structure", by K. W. Zimmerschied, General Motors Co., Detroit.

"Elimination of Waste in Bench Molding", by J. C. Pendleton and R. E. Kennedy, University of Illinois, Urbana, Ill.

"Report of the Conservation Congress", by Paul Kreuzpointer, Altoona, Pa.

"Green Sand Cores", by James Mulvey, Rensselaer Valve Co., Troy, N. Y.

"Report of the Committee on Industrial Education", by Paul Kreuzpointer, Altoona, Pa.

"Iron and Its Properties", by Peter F. Blackwood, Michigan Steel Castings Co., Detroit.

"Dangers of Specialization", by Thomas D. West, Cleveland.

"Semi-Steel", by R. H. Probert, James Leffel & Co., Springfield, O.

"Tests of Cast Iron", by W. P. Putnam, Detroit Testing Laboratory, Detroit.

"Memorandum on the Preparation of Standard Specifications for Cast Iron for International Export Use", by Dr. Richard Moldenke.

"Industrial Pioneering, or the Establishment of a Foundry in a New Territory", by L. L. Anthes, Anthes Foundry Co., Toronto.

Cost Congress

"Foundry Cost Keeping" address by F. J. Stevenson, Cost Expert National Association of Stove Manufacturers, Hoosick Falls, N. Y.

"Efficiency in Foundry Operations, the Essential Factor in Reducing Production Costs," address by A. K. Hathaway, Tabor Mfg. Co., Philadelphia.

"Efficiency in Foundry Work," by F. A. Parkhurst, Aluminum Castings Co., Detroit.

"Revision of the A. F. A. Standard Foundry Cost System," by Harrington Emerson, 30 Church street, New York City.

"Prevailing Practice in Estimating the Selling Price of Castings," by A. O. Backert.

Malleable Iron

"Manufacture of Malleable Cast Iron," by Harrold Hemenway, H. W. Cooper Saddlery Hardware Mfg. Co., Moline, Ill.

"Test of Malleable Cast Iron," by Enrique Touceda, Albany, N. Y.

"Effect of Silicon and Carbon in Malleable Iron Practice," by A. L. Polland, Johnston Harvester Co., Batavia, N. Y.

"Malleable Iron Practice," by J. P. Pero, Missouri Malleable Iron Co., East St. Louis.

"Researches in the Annealing Process for Malleable Castings," by Oliver W. Storey, University of Wisconsin, Madison, Wis.

Steel Session

"The Electric Furnace in the Steel Foundry," by W. L. Morrison, Welland, Ont.

Discussion of Mr. Morrison's paper, by G. J. Stock, Darlington, Eng.

"Making Steel Direct from Ore in the Electric Furnace," by Prof. T. A. Louden, Toronto, Ont.

"Side-Blow Converter Practice," by John Gregson, Sivyer Steel Casting Co., Milwaukee.

"Manufacture of Acid Steel for Castings", by A. F. Blackwood, Detroit.

"Notes on the Microstructure of Steel", by Prof. Wm. Campbell, New York City.

"Some Defects in Steel Castings and Remedies for Them", by John Howe Hall, New York.

"Report of the Committee on Steel Foundry Standards", by Dudley Shoemaker, chairman American Steel Foundries, Indiana Harbor, Ind.

Profitable Corporation.—The Potomac Gears Co., Cumberland, Md., which commenced business in 1908, has paid dividends of 92 per cent for the year just ended. The business is entirely cooperative, the stock being owned by 30 men, all employes. The company just has declared a dividend of 60 per cent. Last December, as a Christmas gift, it posted a dividend of 20 per cent, and, with a standing monthly dividend of one per cent, the total for the year has been 92 per cent. The employes number 300, including men, girls and boys.

Dreadnoughts

Will Require About 65,000 Tons of Steel

Washington, Aug. 4.—The Navy Department last Saturday issued to proposed bidders specifications for the three new dreadnoughts authorized by Congress this year. The combined steel tonnage will aggregate approximately 65,000, according to a statement made to THE IRON TRADE REVIEW by Admiral Richard Morgan Watt, chief constructor of the Bureau of Construction and Repair. The specific division of the various tonnages, he said, is confidential. It is believed, however, that a fair estimate of the different classes of steel required for the three vessels would be 30,000 tons of armor, with a similar tonnage for plates and shapes, and perhaps 5,000 or 6,000 tons of castings. The bids will be opened at the Navy Department on Oct. 6.

These vessels will be the largest ever designed for the United States navy. They will be heavily armored and will be propelled by turbines and fitted with oil-burning boilers of the water tube type.

Interest in the bids is heightened by reason of the crusade of Secretary of the Navy Daniels in relation to steel contracts for battleships. Two of them will be in all probability built at private yards and the other at a navy yard, perhaps at New York. The vessels are to be named the California, Mississippi, and Idaho. The limit of cost, exclusive of armor and armament, is $7,800,000 each. The combined cost may reach $35,000,000 or more. In the main battery of each vessel will be 12 14-inch guns and four submerged torpedo tubes and in the torpedo defense battery 22 5-inch rapid-fire guns.

Fire did several thousand dollars damage to the building of Ebner & Sons, scrap dealers, East Fourth street, Springfield, O., last week.

Field Day

Of Cleveland Engineers—Will Go to Detroit Next Month

Saturday, Aug. 1, was stag field day of the Cleveland Engineering Society, at Nela Park, East Cleveland, the attractive new home of the National Lamp Works of the General Electric Co. No manufacturing is done at this plant, which is devoted to scientific investigation and to the promotion of most efficient salesmanship. After visiting the various buildings, the 187 engineers in the party listened to a lecture on Color and Light, by M. Luckiesh, one of the engineers of the company. This lecture, which was illustrated by means of light thrown on paintings and other objects, to show the effects of different methods of lighting, proved highly interesting.

Following the lecture, there were base ball games, swimming matches, tennis games and numerous athletic contests. The program was concluded with the serving of an elaborate dinner, after which prizes were distributed to the winners of the different athletic contests by Willard Beahan, an ex-president of the society. The program of the day was in charge of Robert I. Clegg, chairman of the program committee. President Whitlock announced that the next meeting of the society will be held in Detroit, Saturday, Sept. 12, when several large automobile plants will be visited.

Slight Increase in Activity

Chicago, Aug. 3.—The Illinois Steel Co. is operating 27 of its 42 open-hearth furnaces at the Gary plant, a slight increase over previous operations. The Corporation now has 15 of its 26 blast furnaces in this district in blast. This indicates operation of 60 to 65 per cent of its ingot capacity.

Will Inspect Bridge Work

The Pittsburgh office of the American Bridge Co. has invited members of the Engineers' Society of Western Pennsylvania to inspect the 1,000-foot span for the Hell Gate bridge which is being built jointly by the Pennsylvania and the New York, New Haven & Hartford railroads. A special train will leave the Pennsylvania station at Pittsburgh at 1:40 p. m., Aug. 8, for Ambridge, Pa., where the bridge has been assembled. The bridge is of special interest because of the great size and weight of its chord sections. The end bottom chord sections weigh 150 tons each, and are 11 feet deep, 7½ feet wide and are made up of heavy sections, the web plates being 2 inches thick. Twenty special railroad cars have been built for transporting the heavy members of the bridge. The general dimensions of the bridge follow: Span between towers, 1,017 feet; span center to center of hinges, 977½ feet; spring of arch, 220 feet; depth of arch at crown, 40 feet; height from low water to top of arch, 307½ feet; clearance above high water, 135 feet; height of end posts, 140 feet. The weight of steel work in the arch is 18,000 tons, which averages about 38,000 pounds of steel per lineal foot of bridge. The span of the floor beams is 60 feet and they carry eight lines of 42½-foot stringers. They are of box girder section, 9½ feet deep and 3½ feet wide. The bridge is designed for a four-track railroad system.

Will Build New Foundry

The Pittsburgh Foundry & Machine Co., which has operated a plant at Thirty-first and Liberty streets, Pittsburgh, for a quarter of a century, has completed plans for a new foundry at Thirty-sixth street and the B. & O. railroad, where a half-acre site has been purchased. The company will erect a steel building, 50 x 160 feet, with a 30-foot lean-to running the entire length on each side of the main building. The company manufactures a general line of gray iron castings, up to 15 tons. Plans also have been completed for a large extension to the company's plant at Salem, O. The McClintic-Marshall Co., Pittsburgh, will erect the new plant at Pittsburgh, and W. N. Kratzer & Co., Pittsburgh, will build the addition to the plant at Salem.

The Gem Mfg. Co., Pittsburgh, manufacturer of pressed steel specialties, has purchased a site on the North Side, that city, and will erect a modern plant, 132 x 137 feet. The contract was awarded W. N. Kratzer & Co., Pittsburgh.

Slocum, Avram & Slocum, Inc., Hudson Terminal, New York City, manufacturers of the productograph, have established an office at 640 Engineers' building, Cleveland, in charge of D. S. Cole.

John A. Leighton has filed suit in common pleas court, Cleveland, asking for foreclosure of a mortgage against the Reliable Machine Co., 5320 St. Clair avenue N. E., and the appointment of a receiver.

Obituaries

John Benson Prescott, organizer of the J. B. Prescott & Sons Co., founder, Webster and Douglas, Mass., died Tuesday at his home in Webster.

Max Katz, aged 53, iron and steel scrap dealer in the Pittsburgh district for 27 years, died at his home in that city, Aug. 2. He was a member of the Tree of Life Synagogue.

John B. Allan died July 29 at his home in Oak Park, Ill. He was born at Davenport, Ia., in 1860, studied engineering at the Worcester Polytechnic Institute and was associated with the Edward P. Allis Co. of Milwaukee for 25 years. He was made vice president and general manager of the Allis-Chalmers Co. at its organization. He was general western sales manager for the Westinghouse Machine Co. for several years. He had been in failing health for some time. Burial was at Grand Rapids, Mich., Aug. 1.

William E. Clark, for 25 years a bridge engineer and road master on the Connecticut division of the Boston & Maine railroad, and since 1897 identified with the Rail Joint Co., 185 Madison avenue, New York City, died July 5 at the home of his brother at Charleston, N. H. He was a veteran of the Civil War. In recent years Mr. Clark had been interested in farming, and his faith in the possibility of developing New Hampshire farms could not be shaken. Familiar as he was with the conditions in all parts of the country, he fully believed that these old New England farms could be made as productive of all that makes life really worth while as any part of the country. His great pride was to take something which others had discarded as worthless and make something of it.

Repair Shops Increase Force

Milwaukee, Wis., Aug. 3.—The addition of 400 men has been made to the pay-roll of the repair shops of the West Milwaukee car and locomotive works of the Chicago, Milwaukee & St. Paul Railway Co. For several months, the shops have been operating about 50 per cent and at short hours. The force is now being increased to take care of the demand by reasons of large crops, but A. E. Manchester, superintendent of motive power and in charge of the Milwaukee shops states that business generally is showing so much improvement that he expects further orders henceforth to keep adding men until the entire shop is operating at normal. About 6,000 men are employed when the West Milwaukee shop is in full operation.

Rich Strike

Of Ore Made in Richard Mine of Thomas Iron Co.

One of the largest and richest veins of ore ever discovered in Richard Mine, at Wharton, N. J., owned and operated by the Thomas Iron Co., was found June 27, and enough development work has already been done to show that the vein is of very great value. A drift 132 feet long has been driven along the vein, and in one place the width of the vein has been found to be 21 feet 8 inches and in another place, about 40 feet away, the vein is more than 25 feet. This body of ore is on the other side of the fault, which runs across the property near the eastern boundary. No ore ever has been discovered on the other side of this fault, although the report of the Geological Survey of New Jersey, Volume 7, published in 1910, reports that a drift was cut through for a distance of 90 feet southeast and 15 feet northwest without discovering any ore.

The ore in this vein is of very high grade. One sample of ore about 6 feet inside the vein analyzed 67.55 per cent in iron. A sample taken every 12 inches across the full width of the vein was analyzed by Dr. P. W. Shimer, of Easton, Pa., who reported that the iron content was 58.99 per cent.

This ore was found on a level with the bottom of No. 5 slope, which is exactly at sea level. The collar of the shaft is 787 feet above sea level.

On account of shutting down the No. 1 furnace on July 31, the Richard Mine also will be closed temporarily, but the pumps will be kept running so as to keep the mine unwatered. When the mine resumes operations, it will be possible to get out a large quantity of ore at a reasonable cost. This mine already has produced 3,100,000 tons of iron ore, and it is probable that another million tons can be mined.

Canadian Northern Orders

Toronto, Aug. 3.—Orders have been placed by the Canadian Northern Railway with the Canada Car & Foundry Co., National Steel Car Co., Crossen Car Co. and Preston Car & Coach Co., amounting in all to over $1,500,000 for equipment sufficient to enable them to put on the most modern service between Toronto and Winnipeg by way of the new line from Port Arthur to Sudbury.

A number of privately-owned electric light and power companies belonging to the Canadian Electrical Association, the head office of which is in Toronto, representing a capital of over $200,000,000 have set on foot a movement to cooperate in the purchase of electrical equipment and supplies. By joint action it is hoped to lessen considerably the cost of equipment and possibly to lower expenses to the consumers.

Two Bridges

Will Be Built on Panhandle Division of Pennsy

Harrisburg, Pa., Aug. 3.—Among applications for bridges approved by the State Water Supply Commission are two for the Panhandle division of the Pennsylvania railroad, one of which will be erected near Burgettstown and the other near Noblestown. The Jones & Laughlin Steel Co., Pittsburgh, was given permission to build a wall along the south bank of the Monongahela river from South Twenty-second street to the pier of the Monongahela connecting railroad, which is controlled by the Jones & Laughlin interest.

Representatives of the State Department of Labor and Industry will inspect foundries in the Pittsburgh district in the near future to collect data for consideration by a committee on safety standards. Employers will be asked to submit suggestions to the committee.

English Stocks Gain

For the first time in a number of weeks, Middlesbrough, English pig iron stocks in public store, showed an increase during the week ending July 16. This gain was 2,255 tons, bringing the total to 80,749 tons, or 57,915 tons less than Jan. 1, and as compared with 201,528 tons on the corresponding date in 1913. Cumberland district stocks dropped 720 tons to a total of 4,264 tons, a net loss since January of 4,694 tons. A year ago, these stocks were 22,999 tons. Shipments from the Middlesbrough district for the week ending July 16, were 34,817 tons, as against 44,807 tons for the corresponding period in 1913. Total Middlesbrough shipments to July 16, were 645,051 tons, an increase over last year of 14,664 tons. Shipments from Scotland to July 11, this year, were 122,101 tons, a decline of 11,439 tons over last year and from the Cumberland district were 134,810 tons, a loss of 15,606 tons.

The new physical and chemical laboratory of the Bethlehem Steel Co., which is one of the most complete erected by any steel company, has been put in service.

First Shipments

Made By Thompson Pit—Activities of The Cuyuna Range

Brainerd, Minn., Aug. 3. — The Thompson pit mine of the Inland Steel Co. at Crosby has made its first shipments since being converted from an underground to a pit mine, 38 cars of ore being sent in the first trainload to the ore docks at the head of the lakes. The mine is expected to ship 250,000 tons this season.

Steam shovels are now at work at the stockpiles of the Armour No. 2 and the Kennedy mines of the Rogers, Brown Ore Co. These mines since early spring have been shipping from shaft to cars.

The Wilcox mine of the Canadian-Cuyuna Ore Co. has its shaft in ledge and now down 110 feet. Drifting will commence at the 200-foot level. The Brainerd-Cuyuna mine in the city limits of Brainerd may conclude to sink a drop-shaft similar to the Wilcox mine.

The Soo line will shortly build two extensions, one from the Iron Mountain mine to the Crosby-Riverton line and one connecting their tracks near the Crosby depot with the Cuyuna Northern railway tracks at the latter's Ironton depot. Bids have been asked for grading.

President E. E. Marshall, of Philadelphia, of the American Manganese Mfg. Co., visited the range and inspected the subsidiary mines, the Cuyuna-Mille Lacs and the Cuyuna-Duluth. The company expects to operate a furnace in October, with 90 per cent Cuyuna ore. The Cuyuna-Duluth mine at Ironton may ship 100,000 tons this season and the Cuyuna-Mille Lacs 125,000 tons.

The Barrows Mining Co. has been incorporated by Duluth and Brainerd people and will sink a new shaft and start a mine under the supervision of C. B. Rowley, of Brainerd, in section 16, township 44, range 31, on Northwestern Improvement Co. property, just south of the town of Barrows, considered one of the largest and best bodies of ore on the south range. The Brainerd Mining Co. has put drills on their lands.

The New Jersey Zinc Co., which for some time past has been following the policy of beautifying the borough of Franklin, N. J., and of providing modern homes for its employes, has broken ground for 40 more homes, which, with those already built, will make a total of 140 buildings erected by the company. All these buildings are of the bungalow style.

TIPS FOR NEW BUSINESS

Equipment needs of the Iron and Steel works, Machine shops, Foundries and other Metal Working plants

In New York, the machinery market has lost the slight impetus of a week or two ago. The cause of the setback is the threatening outlook in Europe, which naturally has caused buyers here to view the future with even more uncertainty than before. As an evidence of the seriousness of the European situation, one large machinery exporting house and several smaller ones have received instructions from abroad to make no more shipments. Other concerns which do not engage entirely in export business, but which sell a portion of their product abroad, report cancellations of shipments as a result of cabled instructions from Europe. New business in this market has been of small moment. The most important business placed was six tools for the Newark high schools; these were distributed among several New York concerns. The Seaboard Air Line has put out inquiries for about 12 additional machine tools. The Lehigh Valley has put out inquiries for several tools for its spring shop at Sayre, Pa.

At Chicago, machine tool dealers for the most part are finding a quickening in inquiry and some of this is resulting in sales. The slight improvement evident, however, is not general and some dealers find conditions as dull as have been previously. The improvement is not showing itself in any definite direction, but the inquiry and sales are of a general nature without special indications. Railroads are buying sparingly and recently a bolt-cutter was disposed to the Chicago & North Western R. R. Co., two lathes to the Santa Fe for use in a western shop and two single machines for the Illinois Central.

In Pittsburgh, some machine tool dealers enjoyed a moderate improvement in business in July, compared with that booked the preceding month, but considerable complaint about inactivity continues to be heard. Buyers of rather extensive lines have been able to obtain attractive concessions, and it is understood that competition among builders of heavy rolling mill equipment has resulted in decidedly low figures being offered in some instances.

In Cincinnati, the outlook in the machine tool market for the month of August is anything but encouraging. Rumors of war in Europe have handicapped business, as numerous cancellations on orders for machine tools and requests to withhold shipments, have already been received from European purchasers. A large majority of contracts closed during the past three months has been for the export trade, but very few of these are now certain of being fulfilled. The month of July showed a decrease in business done in comparison with June. At present, only one large machine tool maker in this city is running as high as 85 per cent of capacity, and others are averaging all the way down to a few who are barely operating.

EASTERN STATES

BOSTON.—Brown Mfg. Co., machinery, has been incorporated; $100,000; by Channing W. Willis, Harold P. Williams, Rosa F. Hallahan.

PLYMOUTH, MASS. — Plymouth Foundry Co. has been incorporated; $30,000; by Morton Collingwood, Carrie W. Finney, Ethel W. Harrison.

QUINCY, MASS.—Means & Thatcher, Inc., will erect a $12,000, 3-story factory building here.

WEST GROTON, MASS. — The Groton leather board mills were destroyed by fire; loss, $25,000.

NEW HAVEN, CONN.—New Haven Screw Co., small hardware, has been incorporated; $100,000; by Lewis S. Richardson, Fred A. Bartlett, Pierpont Foster.

PINE MEADOW, CONN.—Chapin Stevens Co., which recently bought the Elmore Tool Mfg. Co., is erecting a 1-story, 40 x 122-foot factory; more equipment will probably be needed.

AMSTERDAM, N. Y.—Delaney & Dickson, automatic inking machines, has been incorporated; $10,000; by S. F. and W. P. Delaney, W. W. Dickson.

BUFFALO. — W. & L. Manufacturing Co., automobiles, motorcycles, has been incorporated; $30,000; by P. U. and B. C. Lee, H. Z. White.

CATSKILL, N. Y.—Martin Cantine Co., of Saugerties is rebuilding its paper mill; more equipment will be needed.

DUNKIRK, N. Y. — Dunkirk Corporation mufflers, motors, engines, has been chartered; $30,000; by E. Caldwell, E. K. Buttolph, R. J. Gross.

MT. VERNON, N. Y.—Benford Manufacturing Co., spark plugs, is having plans made for a $20,000 factory.

NEW YORK.—Consolidated Metal Fireproofing Co. has been incorporated; $30,000; by A. A. Jackson, A. A. Derer, Alfred Baruth, 550 West 157 street.

NEW YORK.—Eckstein, Oliver & Hauser, shoemakers' tools, machinery, have been incorporated; $5,000; by Rubin Eckstein, A. Maurice Gauser, M. Eckstein, 229 East Tenth street, New York.

SYRACUSE, N. Y.—Board of Supervisors has approved the plans for a $35,000 power house on the Tuberculosis Hospital site.

ALLENTOWN, PA.—The Allentown Rolling Mills are building a large addition to their Liberty street foundry in order to handle larger size castings than heretofore.

PHILADELPHIA. — Fairmount Electric & Manufacturing Co. will receive bids shortly for a 2-story 45 x 100-foot factory building.

PHILADELPHIA. — Industrial Tape Mills Co. is having plans prepared for a 3-story, 75 x 225-foot factory; estimated cost, $50,000.

PHILADELPHIA.—Reading-Bayonne Steel Casting Co. has awarded a contract to George A. Koch to erect two large additions to its Reading plant.

PHILADELPHIA.—Charles E. Oelschlager will receive bids for a six-story, 40 x 100-foot, steel and reinforced concrete building, to be erected at 203-05 North Broad street.

ELIZABETH, N. J.—Singer Co.'s foundry will be raised from one-story to three stories; cost, $5,000; it will erect a $3,000, 27 x 30-foot sub-power station for the rolling mill.

PATERSON, N. J.—Paterson Metal Ceiling Co. has been incorporated; $10,000; by Bernard Herriman, Isaac Hirschberg, Emil Herriman, Passaic.

BALTIMORE.—United States Woolen Mills are having plans prepared for a $150,000, 7-story, brick and reinforced concrete building.

BALTIMORE.—McShane Bell Foundry Co. has acquired the property of the Baltimore Hub Co., and filed plans for alterations and additions.

ELKTON, MD.—Elkton Armory commission has decided on plans for an armory; bids will soon be asked.

CENTRAL STATES

AKRON.—City will receive bids until noon, Aug. 11, for sewage plant; pumps and pump house; R. Winthrop Pratt, Cleveland, consulting engineer.

AKRON, O.—Plans are being prepared for the Northern Ohio Traction Co.'s $250,000 office and terminal building, to be 250 x 280 feet, 6 and 12 stories, brick and fireproof construction, to include a large quantity of structural steel, much of which is to be used for train shed.

ATHENS, O.—The county commissioners will open bids Aug. 15 for the superstructure

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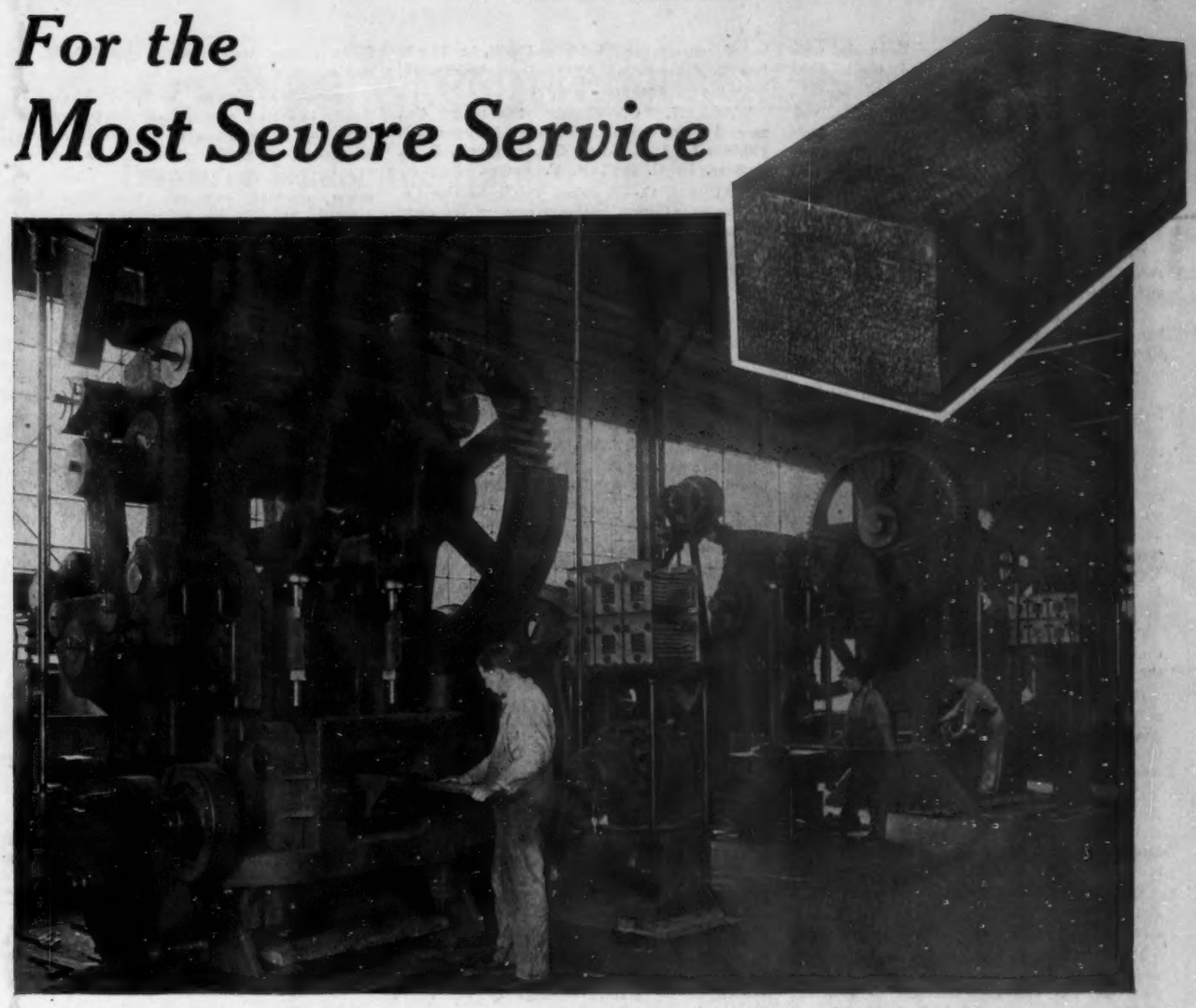

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KANSAS CITY, MO.—1117 Rialto Bldg. MEMPHIS, TENN.—1402 Exchange Bldg.
PHILADELPHIA, PA.—319 Perry Bldg.

of a 114-foot bridge in Rome Township, with 12-foot clear roadway; certified check $200 required.

BRYAN, O.—C. F. Miller, of Defiance, will build a 1-story, 40 x 60-foot factory to manufacture steel, crates, chicken coops and automobile parts.

CANAL FULTON, O.—Fulton Tool Works Co., has increased its capital from $17,500 to $25,000.

CLEVELAND. — Grabler Mfg. Co., steel specialties, will build a $20,000, 3-story office and factory building.

CLEVELAND.—Fenfar Co., auto parts, has been incorporated; $10,000; by E. W. Farr, C. W. Fenner, F. J. Breeler, Otto Gutemann, W. E. Ward, G. A. Ernst.

CLEVELAND.—F. B. Stearns will erect a 5-story, fireproof, brick building which will double the Stearns-Knight output; contracts to be let shortly.

CLEVELAND.—Cleveland and New York capital will erect a $200,000 six-story building on the site now occupied by Stearn & Co., 240-248 Euclid avenue; Cleveland men interested are Samuel Runner, Louis Black, Harry Tyroler, all of the Bailey Co., and C. K. Sunshine, of the Sunshine Cloak & Suit Co.

COLUMBUS, O.—Columbus Die & Tool Co. will erect a $25,000, 1 and 2-story machine shop.

COLUMBUS.—S. A. Kinnear, director of public service, will receive bids until noon, Aug. 11 for alum plant; will require structural steel, piping, valves, conveying equipment etc.

COLUMBUS, O.—Columbus Mill & Mine Supply Co. will erect a 50 x 150 foot, brick and tile fabricating shop; a 5-ton crane with interior steel structure for its support will be installed.

DE GRAFF, O.—The electric lighting plant and several business houses have been destroyed by fire; loss, $100,000.

HAMILTON, O.—W. W. Crawford, county auditor, will open bids Aug. 12 for a concrete and steel sub and superstructure of a bridge in Ross township; certified check 10 per cent required.

LANCASTER, O.—Kyle Mfg. Co., galvanized iron specialties, recently incorporated at $185,000 by Frank Raitz, W. D. Bauman, B. C Kyle and C. M. Rowles, will move from Washington, C. H., to this city and will occupy a factory building on a 5-acre tract; additions to be erected at once.

LIMA, O.—Frank Seiber and Henry Free will erect a $100,000, 4-story, 50 x 200-foot office building.

MASSILLON, O.—City Engineer Yost has estimated the cost of proposed 460-foot viaduct at $19,000; plans include two 120-foot spans; the West street bridge will be used to make a 220-foot approach on the west end.

TOLEDO, O.—Water Works Superintendent Jessner will receive bids until Aug. 10 for 6000 tons of steel pipe for mains.

TOLEDO, O.—Edward F. Neukom is preparing plans, specifications and final estimates for a $200,000 municipal high pressure fire pumping station for this citly.

TOLEDO, O.—Diamond Vial Co. has been incorporated; $600,000; by R. R. Scott, Walter Stewart, W. W. Knight et al.; the company will manufacture glass ware and glass products and is considering the erection of a plant here.

TOLEDO, O.—Frank R. Stahl has the general contract for Roberts-Toledo Auto Co.'s $60,000, 3-story building, to be constructed of steel, concrete, brick, terra-cotta; 100 foot frontage on both Adams and Thirteenth streets.

TOLEDO, O.—Work has been begun for the new boiler shop of T. F. Conley on East Railroad street, Tiffin, O. The building will be of concrete and brick and will be 35 x 70 feet in dimensions. All kinds of boilers will be made at the new factory.

WARREN, O.—Warren Stamping Co., general metal stamping, has been incorporated; $50,000; by J. G. Gates, Charles Myers, P. R. Vautrot, H. G. Roll, R. C. Baxter.

WARREN, O.—Trumbell Public Service Co. will make $125,000 improvements on its plant during the next few months; a high 600-horsepower steam boiler is soon to be installed, equipped with a motor-driven coal handling apparatus; high tension lines, which will carry 22,000 volts to Niles, and the new plant of the Western Reserve Steel Co., will be installed soon.

XENIA, O.—C. C. Henry says that a foundry will be built here; negotiations will be commenced with the Shawnee Refrigeration Co. for a site.

CHARLESTON, W. VA.—Central Engineering Co., construction work, has been incorporated; $25,000; by C. Decker French, Conrad Zimmerman, Davenport, Iowa; W. E. Moore, T. S. Clark, W. G. McCorkle.

PARKERSBURG, W. VA. — Parkersburg, Marietta & Interurban railway will place contract shortly for street car equipment, including steel pay-enter cars.

COVINGTON, KY.—Warman & Wolf Co., of Madison, O., will locate a plant here for the manufacture of aluminum castings.

HIGH BRIDGE, KY.—J. D. Hughes Lumber Co.'s sawmill was burned with $50,000 loss; machinery will probably be replaced.

LOUISVILLE, KY.—Kentucky Corrugated Paper Co., F. S. Bishop, president, will purchase an engine and generator, 220-volts, directly connected, for new factory; motors also needed.

LOUISVILLE, KY.—Motor-driven laundry machinery will be installed in the Progressive Laundry Co.'s plant, now being built; address M. A. Meyers, Inter-Southern building.

LOUISVILLE, KY. — Purified Petroleum Products Co. is in the market for a 20-horsepower motor and other equipment to be installed in its plant, buildings of which are now under way.

LOUISVILLE, KY.—Brinton B. Davis, Inter-Southern building, has preliminary plans for a $100,000, 11-story building which will be occupied by the Kentucky Athletic club; elevators, heating plant, refrigerating system, etc., will be needed.

LOUISVILLE, KY.—Sampson Engineering Co., S. R. Castleman, president, is equipping a plant for the manufacture of automobile equipment, including starters, lighting and ignition systems; machine tools will be purchased.

PEMBERVILLE, KY. — Bushman Bros. electric lighting plant will close Oct. 1; council will advertise for bids for the street lights; plans and specifications to be ready at once.

GOSHEN, IND.—The American Auto Trailer Co., of Waterloo, Ia., will move their plant to this city as soon as a location can be secured.

TIPTON, IND.—The McEntree Plow Co. has been incorporated; $200,000, and will erect a factory here at once.

VEEDERSBURG, IND. — The city plant here is planning to furnish light to four surrounding towns; plant will be increased accordingly.

CHICAGO. — Peerless Appliance Co., mechanical appliances, has been incorporated; $100,000; by R. W. Poelma, 3452 Hayes street, Chicago; H. F. F. Serum, T. J. Keuttler.

CHICAGO. — Henry Schoolkoph, 307-11 West Randolph street, is taking bids on a building for the open board of trade; two stories, 50 x 100 feet.

CHICAGO.—J. W. Snyder, 122 South Michigan avenue, has the general contract for a storage warehouse to cost $40,000, five stories, 50 x 100 feet.

CHICAGO.—George A. Fuller & Co., 140 South Dearborn street, has the general contract for an addition to the Borland block, 18 stories, 50 x 79 feet, steel construction.

CHICAGO.—The William J. Casey Co., screw machine products, has been incorporated; $10,000; by Alfred M. Bays, 25 N. Dearborn street, Chicago; Charles A. Ruth, W. L. Thompson.

PEORIA, ILL.—Kaiser Electric Co. is having plans drawn for the erection of a factory building in East Peoria.

ROCK ISLAND, ILL.—M. T. Rudgren, city clerk, will receive bids until 2 p. m., Aug. 12, for centrifugal pumping unit to consist of 2-stag pump, condensing steam turbine, or 2-phase, 60-cycle, 4800-volt motor, or fuel oil machine.

DETROIT.—Detroit Insulated Wire Co. has increased its capital from $100,000 to $500,000.

DETROIT.—Utility Power Co. has plans completed and will erect a 4-story, 98 x 600-foot factory of cement and steel.

GRAND RAPIDS, MICH.—The Eno Gas & Oil Stove Co., incorporated recently, will erect a plant here shortly.

HOWELL, MICH.—Spencer-Smith Machine Co. has broken ground for a 40 x 100-foot factory building.

LANSING, MICH.—Detroit United railways has applied to the state railroad commission for authority to issue $5,000,000 in securities; this is preliminary to a reorganization under which 20 miles of new track will be built in Detroit, 14 miles outside the city, and 40 miles of double track on its interurban properties.

ANTIGO, WIS. — The Chicago & North-Western R. R. Co. is buying right-of-way between Kopenck, 10 miles north of Antigo, to Pearson City and the Wolf river country, through a virgin timber belt. Construction work is to start about Sept. 1.

DePERE, WIS.—The Depere common council has instructd the city engineer to make estimates of the cost of constructing a new bridge over Fox river to replace the present iron bridge, which was recently condemned. The present bridge is 475 feet long.

GREEN BAY, WIS. — The John Hoberg Co., paper mills, will expend approximately $50,000 in enlarging the mills on Fox river canal. A 3-story addition, 40 x 180, of concrete, steel and brick, will be erected at once.

MADISON, WIS.—The Janesville & Madison Traction Co. has let the contract for grading the second division of the proposed line between Janesville and Madison, and will award contracts for trackage construction and equipment for the first division as soon as the state railroad commission issues the permit.

MILWAUKEE.—Appleby Automatic Sign Co. has been incorporated; $25,000; by W. B. Appleby, Frederick S. Bennett, Chellis C. Wayland; C. C. Wayland, attorney.

ST. LOUIS.—Missouri Callophone Co., recently incorporated for $75,000, will install three drill presses, three lathes and two milling machines.

ALBIA, IA.—The Albia Mfg. Co., S. G. Hunter, president, will open a factory for handling sheet metal for steel garages, grain bins, barn cupolas, spouting, etc.

DES MOINES, IA.—The Chicago & North-Western railway is contemplating building a car capacity repair yard here.

EAST CEDAR FALLS, IA.—Iowa Gate Co. has let a contract for a $50,000 factory building; equipment will probably be needed.

IOWA FALLS, IA.—The Iowa Railway & Light Co. is negotiating for a site for a power plant it proposes to build for the city's electric light supply.

DULUTH, MINN.—Major E. B. Peck,

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Kreolite Block Floor in the plant of The Lunkenheimer Co., Cincinnati, O., Valve Makers

ANY experienced factory engineer or mill superintendent will need but to glance at this shop view to realize the extraordinary wear which this Kreolite Block Floor must withstand daily.

IN THE LUNKENHEIMER PLANT the heavy iron and brass castings that are handled and trucked over their floors would soon wear out any ordinary form of floor construction. That Kreolite Wood Block Floors are giving satisfaction is evidenced by the many return orders they have given us.

THE REASON why Kreolite Wood Block Floors give such satisfaction is because of the careful selection of the wood used, the thoroughness with which the blocks are manufactured and treated, the unequalled quality of the Kreolite Oil, and the use of improved methods of installation.

KREOLITE WOOD BLOCK FLOORS excel in durability, and for this reason have been laid in many of the largest iron working plants in the country. Subject one of our floors to extremely heavy service and then compare results with other types of flooring.

SHOP EFFICIENCY is the watchword in the up-to-date plant these days. Secure its advantages by installing Kreolite Wood Block Floors. Workmen say they are easy on the feet, and that they make them feel like doing their best work. These floors are also smooth, compact and easy to truck over.

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THE JENNISON-WRIGHT COMPANY

309 HURON STREET **TOLEDO, OHIO**

U. S. engineer, will receive bids until Aug. 10 for steel hull, steam survey boat.

MINNEAPOLIS.—Harold G. Cook Co., general machinery, has been incorporated; $10,000; by Harold G. Cook, Harry Smead, Russell Smith.

MINNEAPOLIS.—C. W. Gindele Co., 3333 South La Salle street, has the general contract for a mail and express station for the Great Northern railway, to cost $250 000, brick and steel; two and four stories, 87 x 230 and 87 x 22 foot.

ST. PAUL, MINN.—The North American Oil Engine Co. will construct a $250,000 factory in the Midway district.

SOUTHERN STATES

RICHMOND, VA.—Sprague Safety Control & Signal Corporation has been chartered to manufacture electrical appliances and safety devices for electric and steam cars; Earnest V. Flippen, secretary-treasurer.

ROANOKE, VA.—R. J. Reynolds Tobacco Co. has completed plans for another steel and concrete fireproof building here.

LITHONIA, GA.—City votes Aug. 15 on $35,000 bonds for water works and sewer system; address mayor.

FORT MEADE, FLA.—City votes Aug. 21 on $25,000 bonds to purchase or construct an electric light plant.

MARIANNA, FLA.—City votes Oct. 20 on $56,000 bonds for electric light plant and water works.

OCALA, FLA.—City votes in September on $75,000 bonds for electric light plant; address mayor.

NEW ORLEANS. — Miller-Elmer Manufacturing Co. will erect a 4-story, 35 x 150-foot office building on Magazine street.

SHREVEPORT, LA.—City votes about Aug. 25 on $1,200,000 bonds to purchase or acquire waterworks and sewer system; address mayor.

GALVESTON, TEX.—Gulf, Colorado & Santa Fe railway, F. Merritt, chief engineer, authorized in monthly budget expenditure of $160,000 for improvements and additional property; including $17,975 for addition to engine house at Silsee; $10,447 and $11,549 for extension of two bridges on southern division.

MENA, ARK.—Bear State Power Development Co. has been incorporated; $25,000; by George D. Thayer, J. W. Bradley, Minor Pipkin.

BRISTOL, TENN.—James McBride, hardwood manufacturer of New York, has purchased half interest in Wm. S. Whiting's flooring plant, at Elizabethton; the name will be changed to Elizabethton Flooring Co., and the plant will be doubled in capacity.

WESTERN STATES

LARNED, KAS.—L. D. Burgess, city clerk, will receive bids until 1:30 p. m., Aug. 14, for water works improvements and municipal light and power plant, to include powering stations, extensions on Wells motor-driven pumps, engines, generators, condensers, boilers, stacks, etc.

DEER LODGE, MONT.—The county will build two steel bridges, one over the Big Blackfoot and the other over the North Fork; John E. Manley, chairman of commissioners.

GLASGOW, MONT. — County commissioners will receive bids until Sept. 7 for a steel bridge over Willow creek and another over Rock creek.

SANTA FE, N. M.—State engineer will receive bids until Aug. 29 for a 465-foot bridge over Rio Grande at Errey.

OGDEN, UTAH.—The Utah Construction Co. has awarded the structural steel contract for their $50,000 machine shop and warehouse to James Bureke & Co., Salt Lake City.

ST. MARIES, IDAHO.—The Milwaukee Lumber Co. considers building a 20-mile railroad into the Marble Creek district; estimated cost, $10,000 a mile.

WALLACE, IDAHO.—The Emerald Creek Railway Co. has been incorporated; $45,000; by Fred Herrick, et al.; it is proposed to build about 25 miles of track along Emerald creek.

NORTH YAKIMA, WASH.—Reclamation officers have received authority from Washington, D. C., to proceed with the construction of the Grandview and Outlook pumping plants in the lower Yakima valley; appropriations have been increased to $113,000.

OROVILLE, WASH.—The Okanogan Valley Electric Power Co. has reorganized and has taken over the Similkameen Power Co.'s interest in the power site and plant at the falls of the Similkameen; it considers installing machinery to produce 2,000 horsepower.

SEATTLE, WASH.—Seattle Boiler Works has been incorporated; $50,000; by Frank F. Hopkins, Mary A. Hopkins.

SEATTLE, WASH.—L. M. Grant, engineer for the Pacific Coast Pipe Co. here, has completed plans for a $40,000 reinforced concrete and steel addition to its plant.

SEATTLE, WASH.—Port Commission will receive bids until Aug. 20 for the superstructure and equipment of a 500,000-bushel grain elevator at the East Waterway Terminal.

SEATTLE, WASH.—Rainier Heat & Power Co., Wm. Chappelle, owner, has awarded the preliminary contract for the $300,000, 10-story, reinforced concrete hotel building to Ditelfsen & Gerring at $160,000.

SEATTLE, WASH.—Council has passed an ordinance ratifying and confirming a loan of $829,000 for building a bridge across Lake Washington canal; bids will be received until Sept. 5 for the purchase of these bonds.

SEATTLE, WASH.—The Puget Sound Navigation Co. announces that Lee & Brinton are drawing plans for two suburban passenger boats to cost $20,000 each; to be 100 feet long, 18½ feet beam, equipped with 250-horsepower engines, either Diesel or Talbot superheated steam engines.

SPOKANE, WASH.—Plans have been prepared by City Engineer Morton Macartney for the proposed electrolier lighting system on First avenue, approximate cost, $70,000.

TACOMA, WASH.—The Bismarck lumber mills, burned out with $85,000 loss, will be rebuilt.

TOPPENISH, WASH.—This city contemplates the expenditure of $30,000 for a steel water tank and the replacing of old water mains.

ASTORIA, ORE.—Port Commission will receive bids until Aug. 15 for coal handling equipment; estimated cost, $50,000.

HILLSBORO, ORE. — Fire wrecked the Hillsboro Power & Investment Co.'s power house causing a $15,000 loss; H. V. Gates is owner.

PORTLAND, ORE.—Interlocking electric switches to cost about $35,000 are to be installed in the union depot here.

PORTLAND, ORE.—The Metal Show Case & Fixture Co. has been incorporated; $10,000; by Henry H. Wright et al.

PORTLAND, ORE.—Portland Gas & Coke Co. will erect a $135,000 steel and concrete gas holder on Clinton street.

PORTLAND, ORE.—County clerk will receive bids until Aug. 25 for the purchase of $625,000 bonds, the county's share toward the proposed Columbia river bridge between Portland and Vancouver on the Pacific highway.

LOS ANGELES.—Plans of Chief Electrical Engineer Scattergood, of the power bureau, for transmission lines, sub-stations and distribution of electrical energy in Los Angeles are nearly finished; the San Francisquita Canyon power plant will be completed as soon as $1,482,000 power bonds are sold.

PORTOLA, CAL.—R. B. Young, of Loyalton, Sierra county, will construct an electric plant here.

SAN FRANCISCO. — Automatic Electric Heating Co. has been incorporated; $200,000; J. Ohman, O. C. Edberg, J. E. Smith, E. Illberg, C. O. Evans.

TRADE NOTES

BRISTOL, N. J.—The Thomas B. Harkins Foundry Co. held its annual meeting a few days ago and elected the following officers: President Thomas B. Harkins; secretary-treasurer, James Brooks; directors, Thomas B. Harkins, George Vanvant, John P. Stout, Serrill Douglass and Edgar Smith.

CHICAGO.—Gardiner Storage Battery Co. has increased capital stock from $12,000 to $30,000 and directors from three to five.

CHICAGO.—The Apollo Steel Co., Apollo, Pa., makers of steel sheets, has appointed Theo. Geissmann & Co., Inc., 332 South Michigan avenue, Chicago, authorized district sales agent in the central west.

CONCONNULLY, WASH. — The county commissioners have awarded a contract for the construction of a 167-foot steel draw bridge over river at Mallott to D. S. Gamble, of Brewster. Bowerman & McCloy, Mutual Life building, Seattle, are the engineers.

DANVILLE, ILL.—The Bonner Tool Co. has purchased the Danville Car Co.'s property for $110,000 and will put on a large force of men as soon as machinery can be installed.

MEMPHIS, TENN. — An important contract for motor-driven pumps for installation at a levee pumping station has been awarded by the board of commissioners at Memphis, Tenn., to the Allis-Chalmers Mfg. Co., of Milwaukee, Wis., which entered a bid of $124,125. The commissioners also awarded a contract for sluice gates and check valves for use on the same job to the Chapman Valve Co., which bid $10,810.

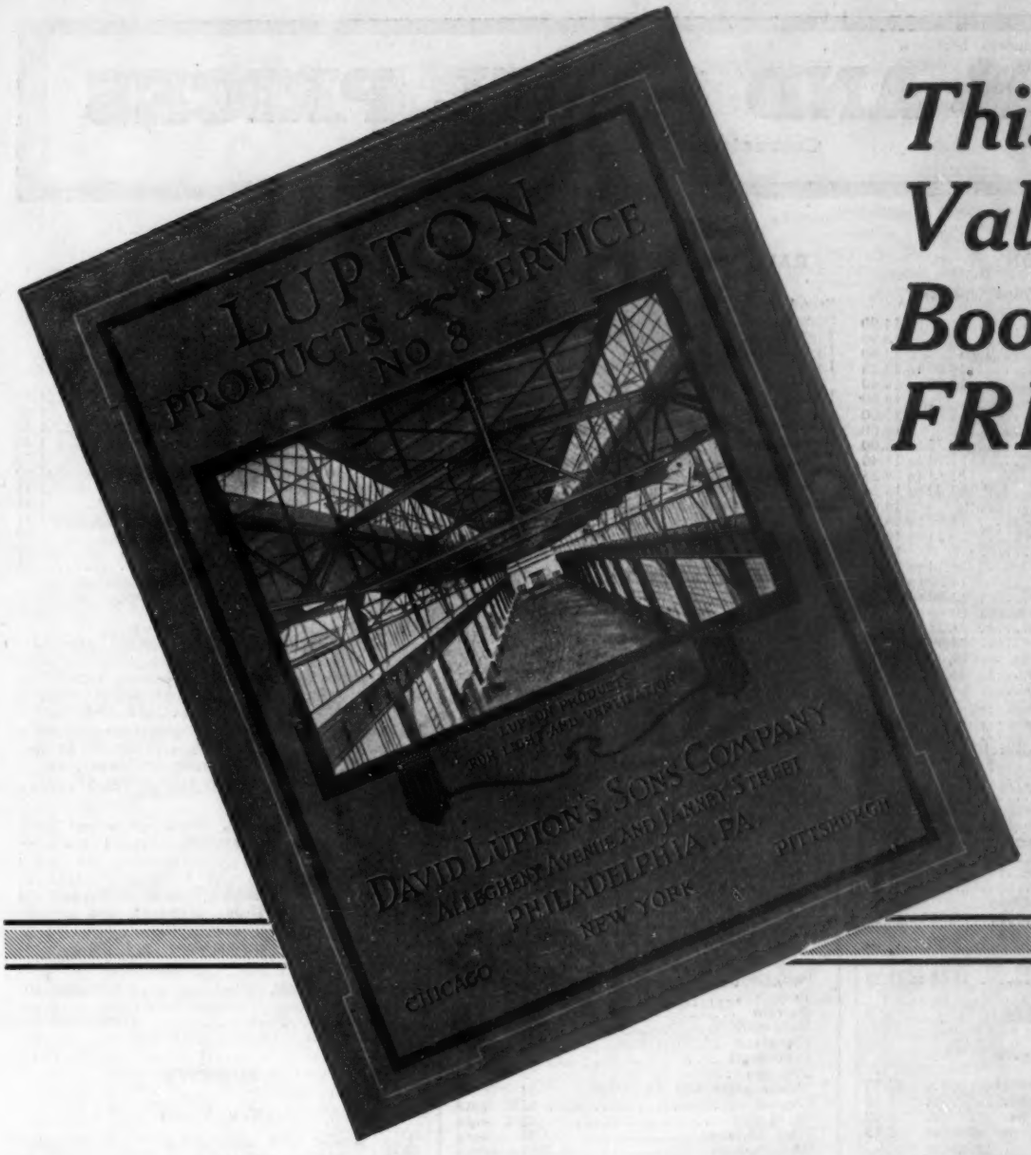
PORTLAND, ORE.—The county commissioners have awarded contract for bridge to span Sandy river near Automobile club house to Geo. W. Griffin, 1001 Alaska building, Seattle, at $10,699 for the superstructure and steel erection and to Portland Bridge Co. for steel at $10,150.

SHARON, PA. — The Sharon Steel Hoop Co., which operates a large hoop and band mill at this city, has purchased a 100 acre site at Wheatland where owners of the mill plan to provide future capacity. Definite plans have not been decided upon, but it is understood the proposed extension will contain the open hearth department and the billet mills. The plant here is operating at practically maximum capacity.

YOUNGSTOWN.—The Andrews & Hitchcock Iron Co., which owns a blast furnace plant at Hubbard, does not expect to complete contemplated improvements for nine months or a year. The company is remodeling one of its two blast furnaces. When completed the new stack will be practically a duplicate of the one re-built several years ago.

NEW CATALOGS

PUNCHES, SHEARS, ETC. — Machinery catalog No. 8 recently issued by Williams, White & Co., Moline, Ill., describes the extensive line of metal working machines manufactured by this concern. The catalog contains 154, 9 x 14-inch pages and nearly 250 illustrations. It is divided into three sections. The first section fully describes bull-dozers, eyebenders, taper forge rolls, upsetters, bending and straightening machines, hydraulic presses, hydraulic plate bulldozers, staybolt breakers, etc. The second section of the catalog covers hammers, both for forging and riveting. The third section comprises shearing and punching machinery including a great variety of standard single and double end C-frame punches and shears, multiple punches, gate shears, horizontal punches, bar shears, angle shears, etc.



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Bessemer, valley	$14.00
Bessemer, Pittsburgh	14.90
Basic, Pittsburgh	13.90
Basic, eastern Pa.	14.00 to 14.25
Malleable, Pittsburgh	13.90 to 14.40
Malleable, Chicago	14.00
Malleable, Philadelphia	14.75 to 15.00
Malleable, Buffalo	13.00
No. 1X Philadelphia	14.75 to 15.00
No. 2 foundry, Pittsburgh	13.90 to 14.40
No. 2 foundry, Cleveland	13.75 to 14.25
No. 2 foundry, Ironton	13.00 to 13.50
No. 2 foundry, Chicago	14.00
No. 2X foundry, Philadelphia	14.50 to 14.75
No. 2X foundry, New York	14.25 to 14.75
No. 2X foundry, Buffalo	13.00
No. 2 plain, Philadelphia	14.50 to 14.75
No. 2 plain, New York	14.00 to 14.25
No. 2 plain, Buffalo	12.50 to 12.75
No. 2 southern, Birmingham	10.00 to 10.50
No. 2 southern, Cincinnati	13.25 to 13.75
No. 2 southern, Chicago	14.85 to 15.85
No. 2 southern, Philadelphia	15.00 to 15.25
No. 2 southern, Cleveland	14.35 to 14.85
No. 2 southern, New York	14.75 to 15.00
No. 2 southern, St. Louis	14.50 to 15.00
Virginia 2X, Philadelphia	15.30 to 15.55
Virginia, 2X, Jersey City	15.30 to 15.75
Virginia, 2X, New Eng., all rail	15.75 to 16.25
Gray forge (eastern Pa.)	13.75
Gray forge, Pittsburgh	13.65
Gray forge, Birmingham	9.00 to 9.50
Silveries, 8 per cent, Cleveland	17.55
Silveries, 5 per cent, Birmingham	12.50
Silveries, 5 per cent, Chicago	16.35
Standard low phos., Phila.	20.50
Lebanon low phos., furnace	17.00 to 17.50
Low phos., Pittsburgh	21.65 to 21.90
Charcoal, Lake Superior, Chgo., Nos. 1 to 4	15.75 to 16.50
Charcoal, Buffalo	15.75 to 16.75
Charcoal, Birmingham	25.00
Middlesbrough, No. 3, Phila., ex-ship	15.00 to 15.25

IRON ORE

(Lower lake ports.)

Old range Bessemer, 55 per cent	$3.75
Mesabi Bessemer, 55 per cent	3.50
Old range, non-Bess., 51½ per cent	3.00
Mesabi, non-Bessemer, 51½ per cent	2.85

(Per unit Philadelphia.)

Foreign Bess., 50 to 65 per cent	7 to 8c
Foreign non-Bess., 50 to 65 per cent.	7 to 8c

COKE

(At the ovens.)

Connellsville furnace	$1.75
Connellsville fur. contr.	1.85 to 2.00
Connellsville foundry	2.25 to 2.50
Connellsville fdy., contr.	2.40 to 2.50
Wise county furnace	1.90 to 2.10
Wise county foundry	2.25 to 2.75
Pocahontas furnace	1.90 to 2.05
Pocahontas foundry	2.25 to 2.40
New River, foundry	2.75 to 3.50
New River, furnace	2.20 to 2.35

FERRO-ALLOYS

Ferro-manganese, Baltimore	$38.00 to 39.00
Ferro-silicon, 50 per cent, Pbgh.	71.00 to 73.00
Ferro-silicon, 50 per cent, Phila.	71.00 to 73.00
Ferro-sil., 12 to 13 per cent, Pgh.	22.90
Ferro-sil., 11 to 12 per cent, Pgh.	21.90
Ferro-sil., 10 to 11 per cent, Pgh.	20.90
Ferro-sil., 9 to 10 per cent, Pgh.	19.90
Ferro-carbon titanium, carloads, per lb.	8c to 12½c

SEMI-FINISHED STEEL

Bess. billets, Pbgh. and Yn.	$19.00 to 19.50
Open-hearth bil., Pbgh. and Yn.	19.00 to 19.50
Open-hearth bil., Phila.	21.90 to 22.40
Bess. sheet bars, Pbgh. and Yn.	20.00 to 20.50
Op.-h'th sh. bars, Pbgh. and Yn.	20.00 to 20.50
Forging billets, Phila.	24.90 to 25.90
Forging billets, Pittsburgh	24.00 to 25.00
Wire rods, Pittsburgh	24.50 to 25.00

RAILS AND TRACK MATERIAL

Stand. Bess., rails, Pbgh.	1.25c
Stand. open-hearth rails, Pbgh.	1.34c
Light rails, 8 lbs., Pbgh. or Chi.	1.40c
Lgt. rails, 12 lbs., Pbgh. or Chgo.	1.35c
Lgt. rails, 16 to 20 lb., Pbgh. or Chicago	1.30c
Lgt. rails, 25 to 45 lbs., Pbgh. or Chicago	1.25c
Relaying rails, standard, Chgo.	$23.00 to 24.00
Relaying rails, light, Chicago	21.50 to 22.50
Angle bars, st. sect. Pbgh., base	1.50c
Angle bars, st. sections, Chgo.	1.50c
Spikes, railroad, Pbgh.	1.40c to 1.45c
Spikes, railroad, Chgo	1.55c
Track bolts, Pbgh	2.00c
Track bolts, Chgo	2.00c

SHAPES, PLATES AND BARS

Structural shapes, Pittsburgh	1.15c
Structural shapes, Chicago	1.33c
Structural shapes, Philadelphia	1.25c to 1.30c
Structural shapes, New York	1.26c to 1.31c
Structural shapes, San Francisco	2.00c to 2.05c
Tank plates, Chicago	1.33c
Tank plates, Pittsburgh	1.10c to 1.15c
Tank Plates, Philadelphia	1.25c to 1.30c
Tank plates, New York	1.26c to 1.31c
Bars, soft steel Pittsburgh	1.15c
Bars, soft steel, Chicago	1.33c
Bars, soft steel, Philadelphia	1.30c
Bars, soft steel, New York	1.31c
Hoops, carloads, Pittsburgh	1.25c

Freight Rates, Finished Material

From Pittsburgh, carloads, per 100 pounds to:—

New York	16 cents
Philadelphia	15 cents
Boston	18 cents
Buffalo	11 cents
Baltimore	14½ cents
Cleveland	10 cents
Cincinnati	15 cents
Chicago	18 cents
Minneapolis and St. Paul	32 cents
Denver	67½ cents
St. Louis	22½ cents
New Orleans	30 cents
Birmingham	45 cents
Pacific coast, plates and shapes	80 cents

Hoops, less carloads, Pittsburgh	1.30c
Bands, Pittsburgh	1.15c
Shafting, carloads, Pbgh., disc. contract	66 to 67 off
Shaft'g less carl'ds, Pbgh., disc.	63
Bar iron, Chicago	1.05c to 1.10c
Bar iron, Philadelphia	1.15c to 1.20c
Bar iron, New York	1.25c to 1.30c
Bar iron, Cleveland	1.20c
Bar iron, Pittsburgh	1.20c to 1.25c
Hard steel bars, Chicago	1.25c to 1.30c
Smooth finish'g mchy. steel, Chi.	1.68c

SHEETS AND TIN PLATE

No. 28, black, Pittsburgh	1.80c to 1.90c
No. 28, black, Chicago	2.03c to 2.08c
No. 28, tin mill, black, Pbgh.	1.80c to 1.85c
No. 28, galvanized, Pbgh	2.75c to 2.85c
No. 28, galvanized, Chgo	2.98c to 3.03c
No. 10, blue, annealed Pbgh	1.35c
No. 10, blue, annealed Phila.	1.50c
Tin plate, 100 lb., coke, base	$3.25 to 3.30

IRON AND STEEL PIPE

(Pittsburgh.)

	Black Butt-weld.	Galv. Butt-weld.
Steel, ⅛ to 3 inches	80	71½
Iron, ⅛ to 2½ inches	70	61
	Lap-weld.	
Steel, 2½ to 6 inches	79	70½

BOILER TUBES

Steel, 3½ to 4½ inches	73
Iron, 3½ to 4½ inches	60

WIRE PRODUCTS

Wire nails, jobbers, Pittsburgh	$1.55
Wire nails, retailers, Pittsburgh	1.60
Plain wire, jobbers, Pittsburgh	1.35
Plain wire, retailers, Pittsburgh	1.40
Galvanized wire, jobbers, Pbgh	1.75
Galvanized wire, retailers, Pbgh	1.80
Polished staples, Pbgh	1.55
Galvanized staples, Pbgh	1.95
Barb wire, painted, jobbers, Pbgh	1.55
Barb wire, painted, retail'rs, Pbgh	1.60
Barb wire, galv., retail's, Pbgh	2.00
Barb wire, galv., jobbers, Pbgh	1.95

BOLTS AND NUTS

(Delivered within 20-cent freight radius.)

Carriage bolts, 3/8 x 6 inches, smaller or shorter, rolled threads, 80 and 20; cut threads, 80 and 15; larger or longer, 75 and 15.

Machine bolts with hot pressed nuts 3/8 x 4 inches, smaller or shorter, rolled, 80 and 25; cut, 80 and 20; larger or longer, 80.

Gimlet and cone point lag or coach screws, 80 and 25.

Hot pressed square, blank or tapped nuts, $6.30 off list; hot pressed hexagon blank or tapped, $7.20 off.

Cold pressed, c. and t. square, blank or tapped, $6 off; hexagon, blank or tapped, ⅝ inch and larger, $7.20; 9/16-inch and smaller, $7.80.

RIVETS

Structural rivets, Pbgh.	1.50c to 1.60c
Structural rivets, Chgo.	1.68c
Boiler rivets, Pbgh.	1.60c to 1.70c
Boiler rivets, Chgo.	1.78c

SCREWS

(New York.)

Lag, gimlet and cone point.	80 and 20
Coach, gimlet point	80
Standard Jack	70 and 10
Mch., cut thread, flat head.	50 and 10
Mach., cut thread, round head	50 and 10 and 10
Mch., cut thread, fillister hd.	40 and40 and 10
Mch., rolled thread, flat head or round head	80 and 10
Set screws, iron	75 and 10 and 10
Set screws, steel, per cent advance over iron	25
Square head cap screws	70 and 10 and 10
Hexagon head cap screws	70 and 10 and 10
Fillister head cap screws	60 and 10 and 10
Flat head wood screws	10 and 10 and 5
Round head wood screws	10 and 10 and 5

CAR WHEELS

33-inch Engine truck wheels	$22.00 to $24.00
36-inch engine truck wheels	23.00 to 25.00
33-inch tender wheels	18.00 to 18.50
36-inch passenger train car and tender wheels	20.00 to 20.50
33-inch freight car wheels	15.50 to 16.00

All f. o. b. Pittsburgh.

STEEL SHEET PILING

(Pittsburgh.)

Base sizes	1.55c to 1.60c

TWISTED REINFORCING BARS

(Soft steel, Pittsburgh mill.)

¼-inch and larger	1.15c to 1.25c
⅝-inch	1.20c to 1.30c
½-inch	1.25c to 1.35c
⅝-inch	1.40c to 1.50c
¾-inch	1.65c to 1.75c

IRON AND STEEL PRICES

Corrected up to Tuesday noon

TACKS

(New York.)—

	Discount.
American carpet tacks.	90 and 20 and 10 and 10
American cut tacks...	90 and 20 and 10 and 10
Railroad tacks	90 and 50 and 10
Gimp tacks	90 and 20 and 10 and 10
Finishing nails	70

WIRE ROPE

Galvanized, iron and steel	47½ and 2½
Bright, Iron and steel	55 and 2½

TRIANGLE REINFORCING MESH

(Per 100 square feet f. o. b. mill, car loads.)

No. 4, plain	$1.00
No. 4, galvanized	1.12
No. 7, plain	.49
No. 7, galvanized	.55
No. 23, plain	1.69
No. 23, galvanized	1.88
No. 26, plain	1.17
No. 26, galvanized	1.30
No. 27, plain	.96
No. 27, galvanized	1.07
No. 31, plain	2.49
No. 31, galvanized	2.76
No. 35 plain	1.17
No. 35, galvanized	1.30
No. 39, plain	3.05
No. 39 galvanized	3.38
No. 43, plain	1.10
No. 43, galvanized	1.23

SPIRAL RIVETED PIPE

(Per 100 linear feet, f. o. b. factory.)

4-inch, plain	$ 19.76
4-inch, galvanized	30.74
6-inch, plain	33.05
6-inch, galvanized	49.73
8-inch, plain	43.17
8-inch galvanized	65.00
10-inch, plain	66.42
10-inch, galvanized	96.15
12-inch, plain	83.75
12-inch galvanized	118.30
14-inch, plain	99.14
14-inch, galvanized	138.85
16-inch, plain	117.53
16-inch, galvanized	166.58
20-inch, plain	183.79
20-inch, galvanized	248.39
24-inch, plain	219.92
24-inch, galvanized	293.99
30-inch, plain	324.81
30-inch, galvanized	430.64

CAST IRON PIPE

Three to 24 in., Cleveland	$ 22.35 to 22.80
Four-inch, water, Chicago	26.50
Six to 12 inches, Chicago	24.50
Larger sizes, Chicago	24.00
Six-inch, water, New York	20.50 to 21.50
Four-inch, water, Birmingham	19.50
Six-inch and larger, Birmingham.	19.50

Gas pipe, $1 per ton higher than water.

WAREHOUSE PRICES

Steel bars, Chicago	1.65c
Steel bars, Cleveland	1.80c
Steel bars, Cincinnati	1.70c to 1.85c
Steel bars, Philadelphia	1.65c to 1.70c
Steel bars, New York	1.80c
Steel bars, St. Louis	1.70c
Iron bars, Chicago	1.65c
Iron bars, Cleveland	1.75c
Iron bars, St. Louis	1.65c
Iron bars, Cincinnati	1.65c to 1.75c
Iron bars, Philadelphia	1.60c to 1.65c
Iron bars, New York	1.65c to 1.70c
Hoops, Chicago	2.15c
Shapes and plates, Chicago	1.75c
Shapes and plates, Cleveland	1.90c
Shapes and plates, Cincinnati	1.80c to 1.90c
Shapes and plates, St. Louis	1.80c
Shapes and plates, Philadelphia.	1.65c to 1.70c
Shapes and plates, New York	1.85c
No. 10 blue ann. sheets, Chgo.	1.85c
No. 10 blue ann. sheets, Cleve.	2.15c
No. 10 blue ann. sh., St. Louis.	1.90c
No. 10 blue ann. sheets, Cinci.	1.95c
No. 28 black sheets, Chgo.	2.45c
No. 28 black sheets, Cleveland.	2.60c
No. 28 black sheets, Cincinnati.	2.45c to 2.55c
No. 28 black sh., St. Louis	2.45c
No. 28 galv. sheets, Chgo.	3.45c
No. 28 galv. sheets, Cleveland.	3.60c
No. 28 galv. sheets, Cincinnati.	3.40c to 3.55c
No. 28 galv. sheets, St. Louis.	3.35c

IRON AND STEEL SCRAP

(Net Tons.)

No. 1 railroad wrought, Chgo	$ 9.00 to 9.50
No. 1 railroad wrought, Cleve.	9.50 to 10.00
No. 1 railroad wrought, St. L.	7.75 to 8.00
No. 1 railroad wrought, Cinci.	8.00 to 8.50
No. 2 railroad wrought, Chgo.	8.50 to 9.00
No. 2 railroad wrought, St. L.	7.50 to 7.75
Arch bars and transoms, Chgo.	12.00 to 12.25
Arch bars and transoms, St. L.	11.00 to 11.50
Knuckles, coup. and spr'gs, Chgo.	9.00 to 9.50
Knuckles, coup. & spr'gs, St. L.	9.25 to 9.50
Shafting, Chicago	11.75 to 12.25
Shafting, St. Louis	13.00 to 13.50
Steel car axles, Chgo.	12.00 to 12.25
Steel car axles, St. Louis	11.75 to 12.25
Locomotive tires, Chicago	9.25 to 9.50
Locomotive tires, St. Louis	8.75 to 9.25
Cut forge, Chicago	8.50 to 9.00
Pipes and flues, Chicago	6.50 to 7.00
Pipes and flues, Cleveland	7.75 to 8.25
Pipes and flues, St. Louis	5.75 to 6.25
No. 1 cast, Chicago	9.75 to 10.00
No. 1 cast, Cleveland	10.00 to 10.50

Freight Rates, Coke

Connellsville regions, per 2,000 lbs., to:—	
Baltimore	$1.80
Buffalo	1.85
Chicago	2.50
Cleveland	1.60
Detroit	2.10
East St. Louis	2.80
Joliet	2.50
Louisville	2.50
Milwaukee	2.70
New York	2.85
Philadelphia	2.05
Pittsburgh	.75
Richmond, Va.	2.94
Toledo	1.85
Valley Furnaces	1.20
Cincinnati	2.00

No. 1 cast, Cincinnati	$ 8.50 to 9.00
No. 1 cast, St. Louis	9.50 to 10.00
No. 1 busheling, Chicago	7.50 to 7.75
No. 1 busheling, Cleveland	8.25 to 8.50
No. 1 busheling, Cincinnati	5.75 to 6.25
No. 1 busheling, St. Louis	7.25 to 7.50
No. 2 busheling, Chicago	6.00 to 6.25
No. 1 boiler plate, cut, Chgo.	6.50 to 7.00
No. 1 boiler plate, cut, Buffalo.	9.00 to 9.50
No. 1 boiler plate, cut, St. L.	6.00 to 6.50
Boiler punchings, Chicago	9.00 to 9.25
Cast borings, Chicago	4.50 to 5.00
Cast borings, Cleveland	6.00 to 6.25
Cast borings, Cincinnati	4.25 to 4.75
Cast borings, St. Louis	4.00 to 4.50
Machine shop turnings, Chgo.	5.00 to 5.50
Machine shop turnings, Cleve.	5.00 to 5.25
Machine shop turnings, Cinci.	4.25 to 4.75
Machine shop turnings, St. L.	4.50 to 5.00
Malleable, agl., Chicago	7.75 to 8.25
Malleable, agricultural, St. Louis	7.50 to 8.00
Malleable, railroad, Chicago	8.75 to 9.00
Malleable, railroad, Cincinnati	6.50 to 7.00
Malleable, railroad, St. Louis	7.50 to 8.30
Angle bars, iron, Chgo.	11.75 to 12.25
Angle bars, Iron, St. Louis	10.00 to 10.50
Angle bars, steel, Chgo.	8.25 to 8.75
Angle bars, steel, St. Louis	9.25 to 9.50
Stove plate, Chicago	8.50 to 8.75
Stove plate, Cleveland	7.75 to 8.30
Stove plate, Buffalo	9.75 to 10.00
Stove plate, Cincinnati	6.50 to 7.00
Stove plate, St. Louis	8.25 to 8.75
Bundled sheet, Cincinnati	4.00 to 4.50
Wrought iron pil'g plates, Clev.	13.00

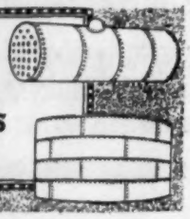
(Gross Tons.)

Heavy melting steel, Pbgh.	$11.50 to 11.75
Heavy melting steel, Buffalo	10.00 to 10.50
Heavy melting steel, Chicago	9.50 to 9.75
Heavy melting steel, Cleveland.	10.00 to 10.50
Heavy melting steel, Cincinnati.	9.00 to 9.50
H'vy melting steel, eastern Pa.	10.25 to 10.75
Heavy melting steel, New York.	8.25 to 8.50
Heavy melting steel, St. Louis.	11.00 to 11.50
Bundled sheet, Buffalo	6.25 to 6.50
Grate bars, Buffalo	9.50 to 10.00
Grate bars, New York	5.25 to 5.50
No. 1 railroad wr'ght east. Pa.	11.75 to 12.25
No. 1 railroad wrought, Pbgh.	11.50 to 11.75
No. 1 R. R. wght., New York.	10.25 to 10.50
No. 1 R. R. wrought, Buffalo.	11.00 to 11.50
Shafting, New York	11.00 to 11.50
Pipes and flues, New York	7.00 to 7.25
Pipes and flues, eastern Pa.	9.50 to 10.00
Mch. shop turnings, New York.	5.75 to 6.00
Machine shop turnings, Buffalo.	5.50 to 6.00
Mch. shop turnings, Pbgh.	7.75 to 8.00
Mch. shop turnings, eastern Pa.	7.50 to 8.00
Cast borings, New York	5.50 to 5.75
Cast borings, eastern Pa.	8.00 to 8.50
Cast borings, Buffalo	6.00 to 6.50
Cast borings, Pittsburgh	8.50
Stove plate, (Jersey points)	8.00 to 8.25
Stove plate, Pittsburgh	9.25 to 9.75
Stove plate, eastern Pa.	8.50 to 9.00
Shoveling steel, Chicago	9.00 to 9.50
Shoveling steel, St. Louis	8.00 to 8.25
Reroll'g rails, 5 ft. & ov., Pbgh.	13.00
Reroll. rails, 5 ft. & ov., Chgo.	11.25 to 11.75
Reroll. rails, 5 ft. & ov., Cleve.	11.00 to 11.50
Reroll. rails, 5 ft. & ov., E. Pa.	12.00 to 12.50
Reroll. rails, 5 ft. & ov., St. L.	11.25 to 11.50
Steel rails, short, Chicago	10.25 to 10.50
Steel rails, short, Cleveland	12.50 to 13.00
Steel rails, short, St. Louis	10.50 to 10.75
Iron rails, Cleveland nom.	13.25 to 13.75
Iron rails, Cincinnati	10.25 to 10.75
Iron rails, eastern Pa.	15.00 to 16.00
Iron rails, St. Louis	11.00 to 11.25
Frogs, switches, guards, Chgo.	9.50 to 9.75
Frogs, switches & g'rds. St. L.	10.50 to 10.75
Car wheels, (iron), Pittsburgh.	11.25 to 11.50
Car wheels, (steel), Pittsburgh.	12.75 to 13.00
Car wheels, Chicago	10.75 to 11.00
Car wheels, eastern Pa.	11.00 to 11.50
Car wheels, Buffalo	12.00 to 12.50
Car wheels (N. J. points)	10.50 to 11.00
Car wheels, St. Louis	11.00 to 11.25
Iron axles, Pittsburgh	20.50 to 21.00
Iron axles, Cincinnati	19.00 to 20.00
Iron axles, eastern Pa.	20.00 to 21.00
Iron axles, Buffalo	21.50 to 22.00
Iron axles, Chicago	18.25 to 18.50
Steel car axles, New York	12.00 to 12.50
Steel car axles, Buffalo	15.00 to 15.50
Steel car axles, Cleveland	14.00 to 16.00
Steel car axles, eastern Pa.	13.75 to 14.00
No. 1 busheling, Buffalo	8.50 to 9.00
No. 1 busheling, Pittsburgh	9.00 to 9.50
No. 2 busheling, Buffalo	6.00 to 6.50
Low phosphorus steel, Buffalo.	15.00 to 15.50
Low phosphorus steel, Pbgh.	14.00 to 14.50
Low phos. steel, eastern Pa.	14.50 to 15.00
No. 1 forge, eastern Pa.	8.00 to 8.50
No. 1 cast, eastern Pa.	12.00 to 12.50
No. 1 cast, Pittsburgh	11.50 to 11.75
No. 1 heavy cast (N. J. points)	11.00 to 11.50
Boiler plate, Cleveland	8.50 to 9.00
Mall. iron, agricul., Cleveland.	9.00 to 9.50
Mall. iron R. R., Cleveland.	10.25 to 10.75
Malleable, railroad, Pittsburgh.	10.50 to 10.75
Mall. R. R., Buffalo	10.75 to 11.25
Mall., R. R. east. Pa.	9.00 to 9.50
Bundled sheet, Pittsburgh	8.50 to 8.75
Bundled sheet, Cleveland	7.50 to 8.00

MISCELLANEOUS SHOP TOOLS

	Discount.
Standard files	80 and 5
Heavy hammers, 3 to 5 lb.	80 and 10
Heavy hammers, over 5 lb.	80 and 5
Gas pliers, 7-inch, per dozen	$2.00
Gas pliers, 12-inch, per dozen	3.50
Cold chisels, per pound	10c to 15c
Wrenches, alligator, discount	75 to 80
Wrenches, drop forged S.	60

STEEL PLATE CONSTRUCTION
Riveted and Welded Tanks
of every description
ACME BOILER WORKS, Canal Dover, O.



Name Plates
All Finishes
Light Stampings
We also polish, plate or enamel these if desired.
The Chandler Co. Springfield, Mass.

WHEELING MOLD & FOUNDRY CO.
WHEELING, WEST VIRGINIA
ROLLS
Chilled, Sand and Steel
Acid Open Hearth
STEEL CASTINGS
ROLLING MILL MACHINERY
PITTSBURG OFFICE—FARMERS BANK BUILDING

THE MARION MALLEABLE IRON WORKS
MARION, INDIANA
MALLEABLE CASTINGS
for General Purposes

MALLEABLE CASTINGS
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We positively guarantee Quality and Deliveries.
THE COLUMBUS MALLEABLE IRON CO.
COLUMBUS, OHIO

West Michigan Steel Foundry Co.
SERVICE and QUALITY UNEXCELLED
MUSKEGON - MICHIGAN

Phoenix Iron Works Company
Meadville, Pa.
Founders, Machinists and Boiler Makers
Engines, Boilers, Castings Rough or Finished
Are prepared to figure on special work

FINE GREY IRON
SUPERIOR
AND SEMI-STEEL
CASTINGS
THE SUPERIOR FOUNDRY CO., CLEVELAND, OHIO

Safety in Handling Heavy Loads

(*Continued from page 252*)

of the boom line and at the upper quarter point by two parts of the same line on a sheave. This double upward force at the upper quarter point being much in excess of the weight of the portion of the boom supported, coupled with the extreme slenderness of the boom, seems to have caused too great a bending moment on the boom. the endwise load being considered.

Derrick Should Have Firm Footing

The base detail of a derrick is important, especially in a derrick having a long boom, on account of the large horizontal force against the foot of the mast. The writer knows of one case where a derrick was set on two 12 x 12-inch timbers. With a low boom the horizontal force was sufficient to rock these heavy timbers. The sheaves for the boom line and the hoisting line were placed between these timbers. The remedy used was to bolt the timbers together, using spacing blocks.

The gudgeon pin is the pin at the top of the mast placed in a vertical position. The goose-necks, large iron straps fastened on the ends of the stiff-legs, pass over this gudgeon pin. This pin is sometimes too small in size and not firmly held at the extreme end of the mast, resulting in crushed fibers of the mast or a bent pin. There should not be merely a ferrule driven in the top of the mast with the pin in a hole in the wood, but there should be a steel plate over the end of the mast in which the pin fits snugly, the plate being bent down over the sides of the mast, or a detail equivalent to this. Also the mast should be securely bolted a short distance from the end to prevent splitting.

The various manufacturers of cranes have standard cranes for given capacities. These standards show the clearances necessary in a building, also the wheel spacing and the loads on the wheels as well as the size of rail. Roughly, the load on a pair of wheels is about double the capacity of the crane. The wheel bases usually run from 7 to 12 feet.

Traveling cranes or gantries are of many forms and present many problems in strength. The one of the very greatest importance is that of bracing. More wrecks have been caused by lack of bracing false work and erection equipment than from any other single cause, if reinforced concrete wrecks be excluded. Timber travelers are usually well braced, but it seems that the larger the traveler and the more the necessity for bracing, the less, relatively, is the provision against lateral sway.

Kentucky Coke Output Grows

Coke is manufactured in Kentucky from coal mined in both the eastern and the western parts of the state, but although the coals of the eastern counties are in large part among the high-grade coking coals of the Appalachian field, most of the coke, until the last two years, has been made in the western district, which is part of the Illinois-Indiana field. Since the recent extensive coal-mining developments in the Elkhorn district of Pike and Harlan counties, however, coke ovens have been built and the principal coking activities have shifted to the eastern part of the state, and Kentucky is now assuming some importance as a coke-manufacturing state. The production has increased from less than 50,000 tons in 1909 to 191,555 tons in 1912 and to 317,084 tons in 1913. During 1913 a plant of 54 Semet-Solvay by-product ovens and 50 new bee-hive ovens were constructed and by a coincidence 104 ovens were abandoned, so that the total num-

ber in existence at the close of 1913 was the same (1,049) as at the close of 1912.

Growing Importance of Graphite

Graphite or plumbago, next to diamond the most refractory of all varieties of carbon, is a mineral of great and increasing industrial importance. The Island of Ceylon, off the coast of India, is the world's greatest graphite-producing center and the United States absorbs about one-half of its product. Other far-off countries that contribute graphite to our industries are Korea, in western Asia, and the French island of Madagascar, off the east coast of Africa, and in spite of political upheavals northern Mexico has continued to contribute important supplies. These large drafts on foreign sources, amounting in 1913 to 28,879 short tons, valued at $2,109,791, are in marked contrast to the small domestic production of natural graphite, which in 1913 was only 4,775 tons, valued at $293,756, according to a statement by the United States Geological Survey.

As it has been fully demonstrated that natural graphite occurs in our own country in practically inexhaustible quantities, the question arises, "Why should our industries be so dependent on foreign supplies?" The reason lies in the mechanical difficulty in concentrating the American product. Most of the graphite found in this country occurs as small flakes in banded rocks known as schists. The graphite forms only 5 to 10 per cent by weight of the rock, and the crushing of the rock and clean separation of the graphite flakes have proved commercially successful only in a few favored places. A number of new methods are now being tried which, it is hoped, will prove more efficient—notably the electrostatic process that has been applied with so much success to the treatment of zinc ores.

The uses for which graphite is suited are dependent on the purity and physical character of the material. The flaky and fibrous graphite from Ceylon finds its principal use in the manufacture of graphite crucibles used in the steel, bronze, and similar industries. The flaky graphite from Madagascar is also used mainly in crucibles, but the earthy graphite from Mexico is used principally in paints, for lubricating, and in pencil manufacture and is not adapted for crucibles.

The percentages of the world's production of graphite used for various purposes have been estimated as follows: Crucibles 55 per cent; stove polish, 15 per cent; foundry facings, 10 per cent; lead pencils, 5 per cent; paint, 5 per cent; lubricants, 5 per cent; all other uses, 5 per cent.

The shortcomings of the United States in the production of natural graphite are in part atoned for by the large amounts of graphite produced in the electric furnaces at Niagara Falls. From its commercial inception in 1897 the industry of manufacturing graphite has grown rapidly until in 1913 the output was valued at nearly a million dollars ($973,397). The various grades of manufactured graphite are adapted to practically all the uses to which graphite has been applied except crucible-making.

A report by Edson S. Bastin on the production of graphite in 1913, just issued by the United States Geological Survey, describes the properties, uses, and origin of graphite, records the production and imports in 1913, and describes the mode of occurrence at most localities where it has been quarried in the United States and at foreign localities which contribute to our domestic consumption. This report may be obtained free by addressing the Director, Geological Survey, Washington, D. C.

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